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ISSN 0725 — 3931

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inside your computer

Vol 1, No 11. May 1982.

news

features

business

reviews

for beginners

departments

It's not an exact copy, but Panasonic's 'IBM-compatible' personal computer is close enough and good enough to set the market alight. We take a preview look on page 19.

Computers, criminals, and police — they all get involved with each other at some stage. Frank Linton-Simpkins tells how, page 52.

Next Month!

A Return to BASIC
Les Bell's popular tutorial series continues with the design of a telephone directory program. Space limitations held it out this month...

FMS-80
Our apologies....also held out of this issue for space reasons was a review of the file manager FMS-80 mentioned on the cover, which printed before the rest of the magazine. It'll be in next month.

The Missing Columns
Space seems to be getting a little tight for all those user columns, but the missing ones will be back next month.

editorial

A FEW weeks back I spoke to the data processing manager of a major city company which makes extensive use of microcomputers. It is planning to install a large (and by large, I mean large*) number of micros in a communications and distributed processing role throughout the company.*

We spoke at length about multi-user operating systems and about networking, and it turned out that they present one of the major problems that stops the company rushing out and buying software.

If the company buys a copy of a program for use on a single, single-user machine, that's fair enough; but what happens if the machine is multi-user? Or even worse, if it is part of a completely distributed network?

Most software suppliers, here and in the US, have no pricing or licensing policy for multi-user microcomputer installations. Legally, it's a bind; in an MP/M system, are the separate copies of a program held in different transient program areas copies in the legal sense? Even though the master disk must remain in the drive while these programs run?

The case with networks is even more confusing. Is a memory resident program in one machine, taken from a disk on another processor, a legal copy? What happens if that user writes part of the program out to disk to make room for another overlay?

Both software distributors and the law, are going to have to consider these and related questions before one can comfortably buy software for a multi-user or network system in the knowledge that one won't be sued by the vendor. It'll be an interesting debate; I just hope we get a sensible policy as a result. □

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SILVER NEC 506

your computer news

Sinclair's Spectacular Spectrum!

CLIVE SINCLAIR has done it again! The man who rocked the computing world with the 'mighty-mite' ZX80 and ZX81 has launched a new baby with colour, high-resolution graphics, sound, memory and big-news peripherals.

The Sinclair Spectrum was one of the best-kept secrets in the business — many knew 'something was in the works', but no-one realised that it would be this much this soon.

Sinclair has justified his boast — made when he lost out to Acorn in his bid for the contract to build the BBC micro — that he could design twice the machine for half the price.

He seems to have done it. Standard configuration for the Spectrum, which is only slightly larger than the ZX81, includes 16K RAM, eight colours, a 32 by 34 screen with 256 by 192 high-resolution graphics, 10 octaves of sound, a bigger basic in a 16K ROM.

It is about the size of a page of this magazine in length and width, yet has a proper keyboard, and is made from only 14 chips. Heart of the unit is a 3.5 MHz Z80A.

All this comes for a mere 125 pounds, cheaper than a ZX81 with 16K pack and an aftermarket keyboard kit. At this rate, it is expected to knock a big hole in the sales of newcomers like Commodore's VIC-20.

The big news, however, is the fact that 100Kbyte microfloppies are available, at an incredible 50 pounds each. Up to eight of them can be connected to the one machine!

And if the 16K memory worries you, forget it — there is also a 48K (on-board) version available, at 175 pounds.

The Spectrum was launched at the ZX Microfair in London on the first weekend in May, and took most people by complete surprise. Even the British magazines devoted to the Sinclair, which had show-special editions, could only hint vaguely at 'something new'.

Public reaction to the Spectrum was excellent, according to a report we had from Peter Docherty, an Australian currently living in Scotland.

His son, also Peter, said he could hardly get near the display to try the Spectrum.

"When I did get a few brief moments at the keyboard, I found it excellent to use," he said.

"And it reminded me far more of the Apple at school than of the ZX81 I have at home."

Top 30 Apple Programs — April 1982

	Name	Position last month:
1	Visicalc	1
2	D Midnight Magic	4
3	PFS	3
4	Apple Cillin Diagnostic	15
5	Wizardry	2
6	Time Zone	-
7	*Star Blazer	-
8	Master Type	8
9	Snake Byte	13
10	Utility City	-
11	Track Attack	5
12	*Kabul Spy	-
13	General Manager	12
14	Superscript II	11
15	Horizon	7
16	Ultima	14
18	Casino	-
19	Sargon II	23
20	Typing Tutor	25
21	Raster Blaster	26
22	Genetic Drift	16
23	DB Utility pack	21
24	Zork II	24
25	* Fooseball	-
26	Doss Boss	18
27	Visifile	-
28	*VisiSchedule	-
29	MicroSoft TASC	28
30	Beer Run	30

***New Program**

Burroughs Desk-Top

BURROUGHS Corporation has launched simultaneously in the United States, Australia and seven other countries the B20 small business desktop computer system.

Marketing manager Jon Matthews said the system would be initially market to large systems users who wanted intelligent, distributive processing capabilities to complement current mainframe installations.

Burroughs also launched five new software products, including a package which helps the non-expert user develop applications software.

Prices for the B20, which can be networked in groups of up to 16 machines, start at $5000 while clusters can be configured in the $100,000 to $200,000 minicomputer range.

Colour screens, graphics capability, and the availability of CP/M are planned for the B20, which uses an Intel 16-bit microprocessor.

Win A Car

LOOKING for a computer? If you buy it from Dick Smith Electronics you also get a chance to win a new Datsun.

A copy of the entry form is supplied to all Dick Smith customers who purchase a VIC 20 Colour Computer, a System 80 or a Sorcerer. □

Digital Correspondent

DIGITAL EQUIPMENT has announced a 9 kg portable hard-copy terminal that prints on plain paper.

Called Correspondent, it is Digital's first terminal designed for on-the-go use by executives and professionals.

It features 132-column printing and other user-selectable features including vertical and horizontal spacing and print widths. Two terminal configurations are available for users to meet various communication needs.

Correspondent incorporates either a direct modem EIA interface (RS232) or acoustic coupler to link the terminal with a distant computer.

The Correspondent, priced from around $2000, prints 9×9 dot matrix characters and has a full 128-character upper and lower case set.

In addition to character output, the terminal has bit-map graphics capabilities, with a 132 by 72 dots per inch resolution. □

Apple Training Centre

A SPECIAL course for secretaries, typists and small business managers who want to use the word processing capabilities of the Apple II personal computer is being offered by distributor Electronic Concepts.

Designed to give extensive use and experience in word processing, the course covers document creation and editing, glossaries, mailing lists and use of labels, file handling, as well as practical applications of word processing in general.

Electronic Concepts now offers a comprehensive range of training courses for existing and potential Apple users, from Introduction to Apple and Basic Programming, through Advanced Basic, Pascal, Apple Fortran, Cobol and Programming with Pilot.

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Computers were supposed to do away with the need for paper. But of course the computer itself, every piece of software and the peripherals, all come with documentation that needs to be carefully filed away for future reference.
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Duration of the courses offered varies between one and two weeks, depending on the nature of the course, with morning, afternoon and evening sessions.

Further information and registration details for Apple training courses are available from Jackie Chalmers at Electronic Concepts, 55 Wentworth Avenue, Sydney, 2000, telephone (02) 212-2833. □

Accounting Source Code

INTELLIGENT Terminals has announced that its accounting package Order Entry Maintenance (OEM) is now available in source code.

This means a tailored system can be developed at a fraction of the cost, as most of the program modules will require only a minimum amount of change to customise for the end user.

It was developed and written for the CP/M operating system (a micro standard) and requires 48K of memory. The program is written in CBASIC.

For futher information contact IT at PO Box 62, Middle Brighton, 3186, (Phone 03 523-6311). □

Business Course

APPLIED Computer Science of Chatswood, Sydney, is offering a two-day computer course aimed at the needs of proprietors of small businesses.

The programming part of the course, which also sets out to answer many of the questions faced in deciding to buy a computer, involves the attendees using a machine each for eight lessons. The courses are limited to 12 people at a time.

Applied Computer Science is not connected with any computer company or other vendor in the industry.

The brochure put out by Applied Computer Science stresses that on completion of the course attendees will not be computer experts, but that they will have a sound appreciation of the problems involved with computer use: they won-t be flying blind.

For further information, contact John Meehan of applied Computer Science at 13 Sprint Street, Chatswood, (Telephone: 419 5581/2). □

Sydney Archives

ARCHIVES Computers has accelerated its plans to open in Sydney following a successful showing at the recent Business Efficiency Fair.

Archives managing director Gower Smith said the Archives user base in Sydney had expanded so rapidly that it required the immediate establishment of a four-man support staff.

The Sydney retail and service operation would trade under the name of Australian Business Solutions (ABS), and had taken space on the 59th Floor of the MLC centre in Martin Place. The phone number is 235 1151. □

Expandable Memory

The HP-87 comes with 32K bytes of user random-acces memory (RAM), 48K bytes of BASIC language in read-only memory (ROM), and 16K bytes of RAM devoted to the display.

The user RAM can be increased to a maximum of 544K bytes by plugging in HP memory modules, which come in increments of 32K, 64K, or 128K bytes.

All of the RAM is automatically configured into a single contiguous block when the machine is turned on, and all the memory is usable for program execution and data storage.

The HP-87's large memory gives it the capacity to handle extremely complex problems and work with very large amounts of data. For example, an HP-87 with maximum memory can analyse a VisiCalc worksheet of 254 by 63 completely full cells.

Suggested list prices of the memory modules are $363 for 32K, $554 for 64K, and $976 for 128K bytes.

The built-in CRT display is 80 columns wide and can be set to display either 24 or 16 lines.

Text or graphics can be displayed, and the user can easily switch back and forth from graphics display to program and text.

In graphics mode, display resolution is 544 by 240 dots, designed for clear, accurate depiction of graphs and charts of data. The screen is optically coated for low glare.

For further information phone Hewlett-Packard: Melbourne (Colin Boyle) 89 6351; Sydney (John Keen) 887 1611; or the HP office nearest you. □

More Memory from HP

A NEW personal computer from Hewlett-Packard features a high-resolution, integrated 80-column test-and-graphics display, enhanced HP BASIC programming language and expanded software support, and user memory that can be incresed from a built-in 32 kilobytes to 544 kilobytes.

The new computer system, called the HP-87, is capable of using its large memory to solve complex problems previously associated with larger computers.

The HP-87 system is the newest member of the HP Series 80 family of personal computers for professionals. It provides solutions for profesionals with new, enhanced HP software and existing Series 80 software. With a plug-in CP/M System, the HP-87 system can run CP/M programs, which number in the thousands. And all of HP's personal computer peripherals are compatible with the HP-87, including the new, low-cost, professional-quality HP7470 Graphics Plotter.

Suggested list price of the HP-87 is $3069 without tax. HP-87 systems range from 32K bytes user memory and 270K bytes of mass storage for $4914 to $9834 for 32K bytes of user memory and five megabytes of mass storage. □

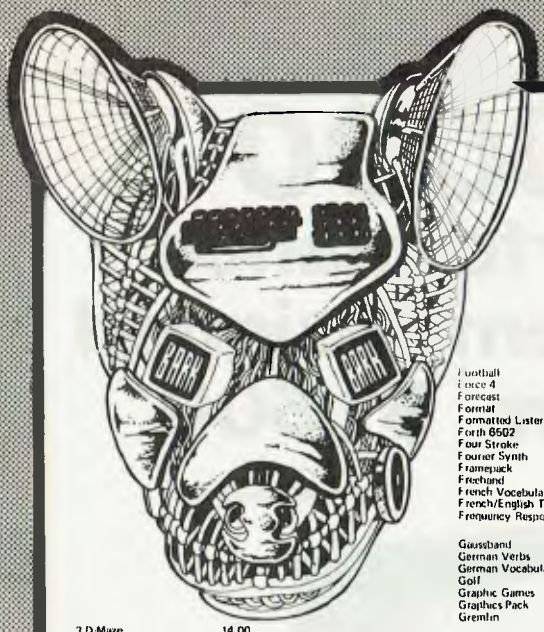
Case APL Terminal

CASE HAS announced an addition to its range of Compatible Plus VDUs; the VC 415.

Providing both APL overstrike and ASC11 character sets, the VC 415 APL is the first low cost VDU designed specifically for the APL user market. It features a full 1920 chatracter display, character underscoring, numeric keypad and 12 program function keys.

Both character and line buffered transmission modes are available as well as remote APL/ASC11 mode select. Options include printer interface for local copy and split-speed operation for full duplex 1200/75 baud transmission.

For further information contact David Hoad on (02) 438-2400. □



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Hospital Users Meet

EDP MANAGERS and Administrators from four major hospitals met in Melbourne recently as a first step towards sharing computer programs and systems.

The four hospitals con cerned are Royal North Shore in Sydney, the Adelaide Children's Hospital, the Royal Children's Hospital in Melbourne and Perth's Princess Margaret Hospital for Children.

Hosted by the Royal Children's in Melbourne, the meeting explored projects of common interest and considered possible exchanges of software.

Mr Garry Busowski, Computer Services Manager at the Royal Childen's, said the first tangible benefit to come fromthe meeting will be the development of a common software catalogue for the three hospitals already using Hewlett-Packard HP3000s.

Help For Disabled

THE typewriter, the fountain pen and the long playing record are all examples of articles in everyday use which were orginally invented to help the disabled. Now, Britain's Institution of Election Engineers (IEE) is offering a prize for the best invention, incorporating electrical or electronic devies, to help the disabled.

The competition is open to individuals throughout the world.

The prize of $8000. A certificate will first be awarded in November this year and further prizes will be awarded every five years. The aim is to carry on the interest in work for the handicapped engendered by the International Year of Disabled People (IYDP) last year and, as the IEE freely admits, to stimulate invention in the engineering field.

Mr Hugh Rossi, Britain's Minister for Disabled People, said that now IYDP was over it would "have meant little unless the impetus it created is carried on, and I am glad to see thqat the IEE thinks likewise."

The prize will be awarded only after the invention is in use and has been proved successful.It will be given to individuals, not to companies or organisations. If more than one individual contributes to the project the prize may be shared.

Devices that will help any kind of disability will be considered. Applications from any part of the world are welcomed. The closing date for entries for the 1982 prize is June 30, 1982.

The telephone, washing machine and a microcomputer system to produce braille were all examples of devices to help the disabled, but even the simplest device, would be considered.

The IEE has a membership of 70,000 electrical engineers, one third of whom specialise in electronics, and 20,000 of whom work overseas.

Devices which have become available during the previous five years will be eligible for this year's prize. Intrested inventors should contact the Institution of Electrical Engineers, Savoy Place, London WC2.

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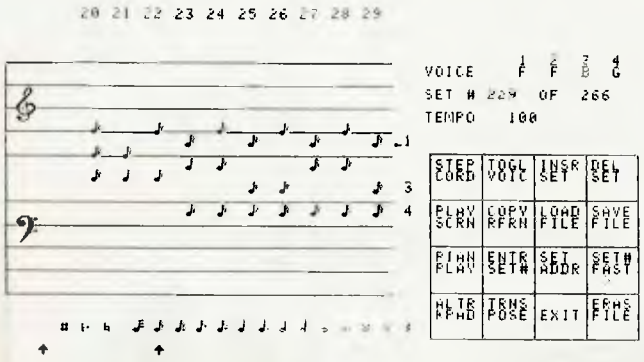

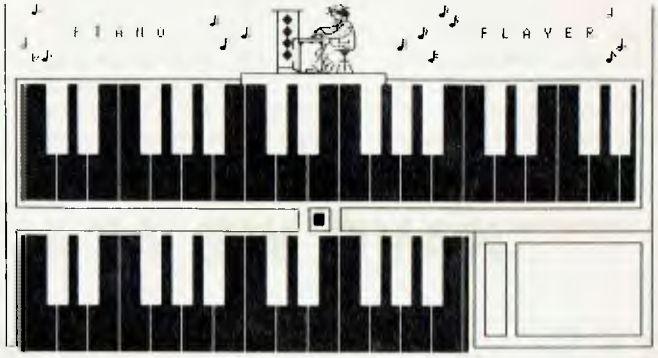

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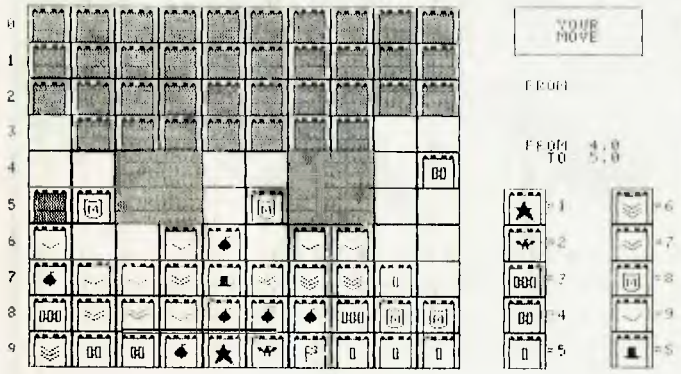

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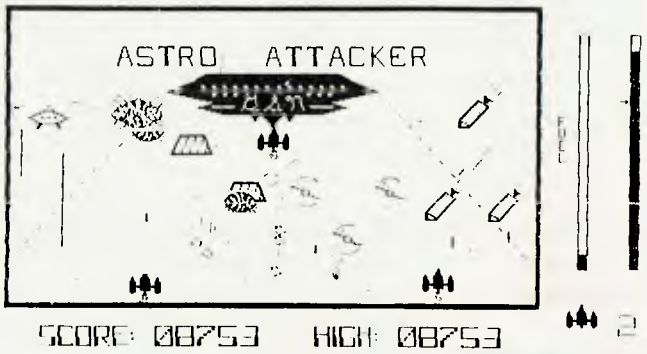
The ultimate in arcade games. Has sound effects and can be used with joysticks or keyboard. $21.95.



EZYFILE — By Bob Stafford.
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Improved Service

USE of a computer service has resulted in a book publishing and distributing firm reducing its book prices by up to 15 percent and dramatically improving its service to book retailers.

The firm, Anzea Bookhouse, of Homebush West in Sydney, is one of Australia's largest publishers and distributors of religious books. It is owned by the Scripture Union and the Australian Fellowship of Evangelical Students Organizations.

Bookhouse is now able to sell the books from American principals at "dollar-for-dollar" prices and British books also have taken a comparable price drop. This is a big change in the controversial area of imported book pricing.

The firm has decided to extend its use of an on-line business computer bureau only a few months after installing its first terminal, and thereby dramatically improving its efficiency and services.

To accommodate its work volume, bookhouse is to install a second terminal connecting it with On-Line Data Processing's $120,000 computer at Auburn.

Bookhouse is using the computer service for a wide variety of functions, including order-entry invoicing, debtors and sales analysis, inventory, creditors and purchasing. General ledger work was recently added to the functions.

Bookhouse's general manager, Mr Jeff Blair, said the computer software had proved "a brilliant concept for book distributing".

He said when Bookhouse now sent monthly statements to bookseller customers, it could include a complete list of the books retained on backorder (which the bookseller firms had ordered but which had not yet been delivered to them), and the booksellers thought that this new service was "wonderful". Bookhouse was now also able to send invoices out with books, not by mail afterwards. This saved postage and labor and resulted in bills being paid more quickly.

The computer service will result in orders received being despatched within 27 hours. With the previous system, entailing manual numeric coding, this often had taken a week.

Under the ODP system, the first six letters of any book title are fed into the computer, which instantly replies with the full title, author, publisher, and price, together with alternative choices.

The firm went on-line with the On-Line 2000 software package in late September. Mr Blair said the on-line system, incorporating video terminal and printer, gave Bookhouse the use of ODP's computer without the necessity of capital investment. The monthly rental covered all costs, including Telecom charges, and bookhouse could 'speak directly' with the computer, entering and receiving information instantaneously.

Mr Blair said the minicomputers Bookhouse previously used could not match the On-Line system in terms of machine capacity or range of services. For further information please contact Mr Ian Nicholas on (02) 212 5488. □

Computer Music

NOW claimed to be Australia's best equipped radio station, Sydney's 2UW has installed a computer system to control the daily pre-programming of all music which goes to air. The system originated through the American company Todd Wallace Associates.

Designed to run on Ohio Scientific hardware, 2UW's system used an Ohio C8P-

DF supplied and installed by Sydney based the TCG Group. Australian agents for the Ohio range.

The systm, using the program available through Todd Wallace, can be used for in-house research analysis as well as the pre-programming of a variety of music formats.

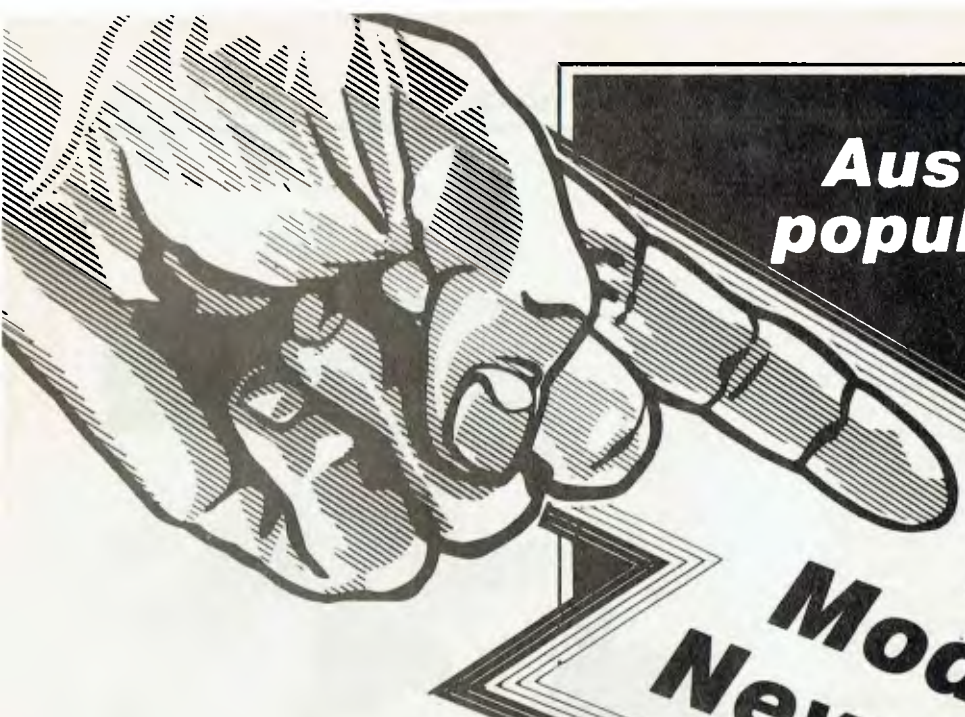
After three months in use it has dramatically improved the efficiency of the station's playlists, providing music formats refined to a degree difficult to achieve previously because of time involved, station manager Ian Lane says.

Music is our main ingredient. Timing is critical to the success of our music programme and therefore to the success of the station. It was vital to us to update our methods of creating playlists. This computer system was found to be the most sophisticated method to provide the information we needed, at the speed we required.

Programmed to compile a working play list of songs for an entire day, the system replaces a manual method which involved about six hours a day selecting from research analysis the appropriate song titles.

The process involved selecting the song titles from some 300 records, mentally computing the rotational sequence, calculating the number of required repeat plays of most popular songs and fitting them into the overall play sequence.

The computer now determines the rotational levels of the list and those songs which are to be repeated more frequently and automatically fitted into the play cycle. □



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Colour Graphics

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Now you can have colour with your System 80 computer! This kit gives you 8 different colours AND it has a PAL encoded modulated RF output which allows it to be used with any standard colour TV receiver.

Only experienced hobbyists or technicians should install this kit. $129.00

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DAISY WHEEL WORD PROCESSOR PRINTER

The Dick Smith Daisy Wheel printer delivers ultra sharp copy which is a definite prerequisite for word processing. It will accept standard office stationery or continuous stationery up to 400mm wide, if required. The cartridge ribbon and economical Diablo fonts are freely available making this a very versatile printer.

Cat. X-3265

$1845 WAS $1,995!

ITOH 8300P DOT MATRIX PRINTER

The Itoh 8300P features high speed, bi-directional printing (125 characters per second), with full upper and lower case character set. It accepts standard fan-fold sprocketed paper up to 240mm wide. This means you can do 80, 40 or 132 column printing. Fitted with standard Centronics type parallel port. A great seller with great features.

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and look at this great new software!

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NEW — Flashing cursor

NEW — Screen print facility (obtain a print-out of any 'page' appearing on the screen)

NEW — Built-in speaker

NEW — Monitor program (suitable for the hobbyist to program in machine language)

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Cassette based, req. 16K.
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SUPERMAZE

The maze game to end all maze games. It can generate mazes up to 100 x 100 elements — it can take you many hours to find the way out!
Cassette based, req. 16K.
Cat. X-3672 **$17.95**

DEPTH CHARGE

The latest version of the arcade favourite. Your mission is to destroy the enemy submarine pack. Good graphics and includes sound.
Cassette based, req. 16K.
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RAIN ANALYZER

A most useful program for the man on the land, the geography student, etc. By keying rain patterns for your area in the past (these figures normally available at your local post office, etc.) you can predict rain fall patterns, volumes, etc.
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TREK 78

The classic computer game based on the ever popular TV series 'Star Trek'. This game utilises good graphics and provides continuous 'status' reports. Your aim is to destroy the enemy and save the Galaxy.
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Drive 0
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Panasonic's IBM Clone

As the world reacts to the announcement of IBM's long-awaited Personal Computer, certain inscrutable Japanese gentlemen are preparing to give Big Blue a run for its money. Les Bell reports.

IT WAS late last August that IBM announced its new baby to the world — the IBM 5150, better known as the IBM Personal Computer, or PC.

The reaction in the US was interesting to watch. Immediately thousands of Apple II owners went on the defensive, and a hot debate ensued on the relative merits of the Apple III and the IBM entry.

Soon, the first units were delivered, and happy PC owners started to appear on The Source, all trying to sort out their communications problems, but basically very pleased with their new machines. A number of add-ons have started to appear — hard disks, expansion boxes, memory boards, and so on, and software authors are falling over each other in their efforts to rewrite existing software and get it onto the new machine.

The reason for all the activity is quite simple. IBM has made personal computing respectable.

Executives who wouldn't be seen dead with an Apple on their desks (Apple being somewhat associated with pop culture), can quite easily come to terms with a conservative box labelled IBM. In addition, people trust IBM — who knows better how to build computers, they reason?

The only drawback so far has been the difficulty of getting a machine. IBM's orders are far in excess of its ability to supply for the next few months, despite the introduction of a second factory in Boca Raton, Florida.

It is against this background that one must view the new announcement from National Panasonic, represented in Australia by The Computer Company. Its new microcomputer, the JB 3000, is claimed by the company to be completely software compatible with the IBM, as well as technically superior. In other words, it's an IBM clone.

Just like the IBM, the CPU is an Intel 8088, running at 4.77 MHz. I presume there's an empty socket next to the CPU for the optional 8087 arithmetic co-processor, but this hasn't been confirmed.

The box holds 64 Kbytes of ROM (BASIC, with sound and colour graphics extensions) and a minimum of 96 Kbytes of RAM. The IBM is sold with 16K of RAM and up, but it's difficult to do much with only 16K, so the Japanese decided to forget about that.

The keyboard, as on the IBM, has more keys than a concert grand. There's a full QWERTY, plus 22 numeric and cursor control keys, as well as 10 programmable function keys — a total of 95 keys all up. The keyboard is at the end of a curly cord.

The video display can be either monochrome or colour. Text format is 40 or 80 columns by 20 or 25 lines, while in graphics mode, you can have 320 by 200 dots in 8 colours or 640 by 400 resolution in black and white.

In the colour mode, therefore, there are twice as many colours to play with than the IBM, while in the mono graphics, the resolution is twice as good. 32 Kbytes are reserved for the video RAM.

Since the BASIC used in the JB 3000 is exactly the same Microsoft BASIC as used in the IBM, the graphics are completely compatible. The same CIRCLE, DRAW and PAINT commands are included.

The system box has a small speaker built in for sound effects and music, and these are supported by the BASIC language also.

For mass storage, one can have one to four minifloppies (160 Kbytes/disk) or full size floppies (1 Mbyte/disk), while the IBM only supports minifloppies.

A Winchester hard disk is under development (Gee, that was a good guess!). The disk operating system is the same as IBM's — what Lifeboat Associates calls MS-DOS (actually this is a refined version of SB-86, Seattle Microcomputer's 8086 DOS).

For those who prefer something a little more advanced, Panasonic will also supply CP/M-86.

The word I have from the US, from users now CP/M-86 for the IBM has been released, is that it is far superior to MS-DOS in almost every respect, and although the historical reasons for the success of CP/M-80 do not apply here, I'm still willing to put money on CP/M-86 becoming the top operating system for IBM and clones.

The Panasonic has an 8-bit parallel interface as standard, while RS-232C is an option. It also contains a cassette interface (a cassette interface?), and there is an optional joystick port.

The entire system is quite compact, consisting of system cabinet with separate keyboard, external disk drives, green phosphor monitor and a C. Itoh printer.

Apparently the cabinets were styled by the Technics hi-fi division of Panasonic, so they match their top-line hi-fi and the entire system is designed to fit into a standard Panasonic wooden hi-fi enclosure!

On the software side, it appears that everything runs on the IBM should work on the Panasonic. That would include IBM's software (mostly not written by IBM

anyway), and other vendor's works.

Already, The Computer Company has arranged an exclusive dealership for the Micropro series of products for the JB 3000. These include WordStar, SpellStar, DataStar, Supersort, Wordmaster and CalcStar.

The availability of WordStar means that Panasonic won't be shackled by the reputedly awful Easywriter word processor sold by IBM. The poor performance of this product and the number of bugs in it have been the major disappointment associated with the IBM.

In addition, The Computer Company is negotiating with two Australian software houses to produce versions of their accounting software for the JB 3000. This will include Debtors, Invoicing, Sales Analysis, Inventory, Creditors and General Ledger.

Software will be sold as complete packages, containing system and data diskettes, manuals, stationery, ribbons, re-order card for supplies, and vouchers for training courses.

A major area where TCC has scored something of a marketing coup is with the announcement of a range of courses for the JB 3000, to be organised and run by Metropolitan Computer College.

The courses include introductory material for the new owner (1 day free course with every computer), covering operation of the machine and its associated software, courses for managers covering basic concepts and programming, and more advanced courses in programming.

Service for the machine will be available on several levels. At the top of the range, one can have a comprehensive service contract covering both preventive and remedial maintenance, parts and labour.

At the next level will be a chain of service centres, located in department stores and elsewhere, where one can drop the machine in the morning and pick it up in the afternoon.

Also available will be a warranty extension programme, which extends the conventional 90 day warranty period.

The Computer Company has set some very high targets for this new machine; for example, it projects an overall market share of over 25 percent by 1986.

At the announcement of the new machine it produced an impressive array of statistics to back its claims.

Singer (owner of TCC), in conjunction with Matsushita (owner of Panasonic) commissioned Stanford Research Institute to do a multi-million dollar major market study of personal computers. Some of the results from the seven-volume report are interesting.

In November 1981, according to the study, the personal computer market leaders were Tandy, Apple, Commodore and Xerox. In 1984, the study predicts 80 percent of the market will be shared between IBM (because it's IBM), Xerox (because of its strong distribution to the office market), Matsushita (because of its size and advanced consumer technology), NEC (because of its strong semiconductor technology) and Tandy (because of its retail distribution).

Matsushita itself is three times bigger than Sony or Sharp, with 170,000 employees and a turnover of US$16 billion. Consequently when it says, as it has, that it aims to have 30 percent market share worldwide by 1984, one has to believe it intends to achieve that.

The Panasonic JB 3000 may well achieve it. IBM is having trouble keeping up with demand (which is probably why the PC is not available in Australia). Panasonic's machine is built at a robotic factory which has a capacity of 70,000 units per month with less than 30 employees. This may be one reason why it will sell at prices generally 15 percent below that of the IBM machine.

We are just waiting for the first units to arrive from Japan (they were due as we went to press), and hope to have a full test in the next issue. □

The Business Machines
Part I

Monty's Magic

As memory has come down in price, so manufacturers have offered more and more power in smaller and smaller packages. Les Bell says the latest offering from Monroe continues this trend...

THE AVAILABILITY of low-cost microprocessors and memory chips has meant the arrival of a new breed of small business computer, one which is much more powerful and user-friendly.

Monroe's new 'occupational computer', the OC8820, continues this trend.

They say good things come in small packages and 'Monty', as Monroe terms the machine, is no exception. In a desktop enclosure, it manages to cram in a Z-80 processor with 128 Kbytes of RAM, two disk drives with 320 Kbytes per disk, a 93-key keyboard and a high-quality orange phosphor screen.

Although it's quite small, the machine doesn't lack in capabilities. Its preferred operating system, MOS (Monroe Operating System), is a multi-user, multi-tasking one. It allows the user to perform such tasks as backing up diskettes, printing invoices and entering orders — all simultaneously.

The Crafty Compact

The OC8820 was supplied to me with a matching printer and a stack of manuals something over a foot high! Many of these manuals are intended for programmers, and the owner/operator would never have to contend with them, but I decided to wade through them anyway, and then set about trying the machine out.

As I mentioned, the machine is incredibly compact. My Televideo terminal dwarfed it on my desk, and it was hard, even for me, to believe that that small a package could contain so much electronics.

Despite the small package, the screen is excellent. The orange phosphor was chosen because it apparently does not leave an after-image on the retina when one closes one's eyes.

Be that as it may, the screen is exceptionally sharp and easy to use, with a variety of formats including double-height characters, underlining, flashing, and graphics. A good feature is that the screen emulates an ADM-3a terminal, making it easy to install a wide variety of software packages.

The keyboard also is a delight to use. The keys are sculpted and ideal for touch typing. All the keys one could require are present, and there is a separate numeric keypad as well as cursor control keys. A separate bank of keys at the top right of the keyboard control functions such as caps lock, while at center top there is a row of user-definable keys.

These keys provide four functions on each of eight keys (using the SHIFT and CONTROL keys), and are typically used by applications programs like WordStar (on which more later). The CP/M operating system disk included a program which lets the user set the keys up for whichever functions he wants, and I assume there is a similar program under MOS (although my lack of familiarity with MOS meant I didn't find it).

At the right of the screen are the two disk drives, each with 320 Kbytes capacity. This is quite respectable for a 13cmdrive, particularly since they are only single-sided, but for those who seek power, a Winchester hard disk was released at the Hanover Fair. The Winnie will make the multi-user operating system at once more powerful and more practical.

At the rear of the machine is the reset button and a row of connectors. There are three RS-232C serial ports, serving the printer, communications and an auxiliary application (such as a plotter), as well as external disk interface and bus expansion. The on/off switch is conveniently located at the side, not the back, something other manufacturers would do well to emulate. I know its only a small point, but it has aggravation value.

The Software Story

Take your pick of software — CP/M or MOS. Although the preferred operating system is MOS, and this is where Monroe will concentrate its support, CP/M has been provided to get the ball rolling, and because there are several attractive independent packages which will not be converted to MOS.

The CP/M implementation, however, should not be viewed as a stop-gap. It is a proper and comprehensive implementation, to the extent of supplying the source code for the BIOS so you (or your programmer) can figure out how it works.

When the manufacturer does not supply the BIOS source, I usually wonder what he's hiding — tricky or nasty programming, an obvious copy of someone else's BIOS, or what? In any case, when something non-standard (such as some kinds of daisy wheel printer or a plotter) has to be driven, the BIOS source is essential.

Several utilities are also supplied, to customise the user- definable keys, format and copy disks, and so on. Again, these have been properly done, and the system seems pretty well bug-free (I didn't find any).

Several programs are available to run under CP/M. Most universal is probably WordStar (rave, rave). Monroe has taken WordStar and customised it considerably, making it more user- friendly by taking advantage of some of the machine's features, in particular the soft keys.

WordStar will be accompanied by a keyboard overlay which slips over the user-definable keys, showing that they call for many of the two-character control sequences used for setting margins, ending edits and so on.

At first, I found considerable difficulty using this version of WordStar as many of the commands are different from the standard version, and my fingers kept wanting to hit the old keys. However, I soon got the hang of it, and for a first time user the system would be ideal.

Unfortunately, this pre-release disk was not accompanied by a manual, so I was unable to figure out a couple of the commands. However, the rest were obvious from the keyboard, and cursor motion was easy, as it does not use the control-E, control-X approach, but actually redefines the cursor arrow keys for use under WordStar.

Very sensible. I wonder how long it will be before terminal manufacturers like Televideo et al change the coding on keyboards so that the cursor arrows generate WordStar codes instead of the largely redundant codes they now use?

Also running under CP/M is the standard accounting software previously sold by Monroe's local agents, Business Control Systems. I was able to fire up the general ledger demonstration as well as the order entry/invoicing system, and take a look at them from the operators point of view.

All this software is written in C-BASIC2, and the main module is invoked simply by typing RUN. Each system has a program disk (in drive A:) and a data disk (in drive B:).

All the programs are designed to work together, so that the invoicing programs, for example, can pick up data from the stock data disk.

The order entry system can maintain stock details on up to 8000 stock items if a hard disk is used, and has capacity for up to 800 debtors and 79 dissections. Using floppy disks, of course, these figures are considerably reduced. Full facilities are provided for stock level reporting, sales analysis (by product, quantity and value, month or year-to-date) as well as interfacing with the debtors package.

The menus are quite clear and easy to use, and the system continually prompts the operator for the required input. One minor irritation is that programs which print reports cannot be prematurely terminated, but must complete the listing; there is no provision for the operator to abort the process.

The general ledger program is similar in presentation and operation. The program can integrate accounts from the debtors, creditors, and so on by transferring dissection totals from the other programs' files. The system is quite versatile, allowing the user to decide upon the dissections and the chart of accounts.

Monroe Software

The primary support from both Monroe and its local agent, Business Control Systems, will be for the Monroe Operating System. MOS takes full advantage of the machine's 128K of memory, and allows apparent simultaneous execution of up to 12 tasks. This is particularly significant in a business environment, even with only one user.

For example, the operator can complete entry into transaction files, and then set the machine up to post the entries to the ledgers in the background mode, while he/she proceeds on to the next data entry job. Meanwhile the machine can also be printing invoices.

While this kind of facility is limited by the floppy disks, the addition of the hard disk will make such operations the standard way of working. In particular, external terminals can be connected through the RS-232C ports, making true multi-user operation possible.

MOS is a modular operating system, relying almost totally on separate tasks which are loaded into memory as required. In a short evaluation it is difficult to get the full 'flavour' of such a software product, but from my browse through the manuals I was able to understand some of the thinking behind this new operating system.

Much of the sophistication of MOS will be transparent to the user, and the programmer will be the first to benefit. For example, MOS directly supports ISAM file structures in the operating system, not the language. This makes life easy for the poor old programmer, while giving the user a dramatic improvement in disk speed.

MOS time slices every 100 ms, running on a 3 MHz processor. Despite this it seemed quite quick and I was unable to get it to lose keyboard characters. A side-benefit of the real-time clock is that jobs can be scheduled for some time in the future. Jobs can also be prioritised, allowing degrees of 'foreground/background' operation.

Monroe BASIC, which runs under MOS, is an extended BASIC which takes full advantage of the MOS facilities. It will be followed soon by a special implementation of Pascal.

Monroe has already made arrangements with some suppliers of CP/M-based software to provide special versions to run under MOS, and apparently conversion is not a major problem. For example, I tried a modified version of Supercalc, which runs under MOS.

This new version is able to use the Monroe's extra memory, providing an extra-large worksheet. For those who have trouble filling the ordinary sized sheet, this might not seem important, but there are now available special Supercalc overlays which perform general accounting functions, and which run out of steam rather quickly in a standard system.

Supercalc behaved like the CP/M version in almost all respects, although I did notice that the 'directory' function of the /I (load) command was missing, presumably because of its strong CP/M dependence.

Monroe has developed a range of accounting software, and this has been made available in source code form to BCS. This will enable the company to modify it 'to suit Australian conditions', as the saying goes.

While the new versions of this software are not yet ready, I was able to try out a demonstration of the US software. This proved to be both user-friendly and extremely powerful (often held to be conflicting attributes). The debtors package includes facilities for dunning letters and a range of reports which leaves no excuses for not managing accounts receivable extremely tightly.

Amongst the reports which the system produces are comprehensive sales reports. I can only say that I'd hate to be a bad salesman working for a company with

one of these machines. Sales and accounting departments are traditionally at loggerheads; with an OC8820 the accounts people would really have the goods on sales!

Business Control Systems is noted for its public accountants' software, and this is being transported across to the OC 8820. In June, a superannuation package will be ready, and MOS word processing will be released in August.

The documentation supplied with the Monroe is excellent. All the manuals were clear and concise, and a lot of the introductory background information was disposed of neatly in a 'Manager's Guide to Microcomputers'.

The MOS manual is fairly heavy going, but it is intended primarily for systems programmers who are used to that kind of thing. It's probably marginally better than the CP/M manuals.

Also supplied with our review system were two printers; one was an 80 column 120 cps printer, while the other was a Spinwriter word processing printer.

The only bad feature of the dot matrix printer was its old-fashioned typewriter style ribbon which slipped a couple of times I was using it and gave me inky fingers. The Spinwriter; well, it was as good as you expect a Spinwriter to be. They have a deserved reputation for both reliability and print quality.

Several levels of service will be available for Monroe systems from BCS. At the top level, one can have two preventative maintenance calls per year, parts and labour and as many service calls as required, for 15 percent of the capital cost of the equipment. BCS's service agreement even includes a penalty clause for non-performance on its part.

Overall, then, the Monroe OC 8820 is a good all-round computer for a small business. It can cope easily with quite demanding accounting tasks, while the boss can use it for planning, database communications and other jobs. It's excellent value for money, and I reckon will be a hit in the small business market. □

Specifications and Report Card

Unit:	Monroe OC8820
Made By:	Monroe
Processor:	Z-80A
Clock Speed:	3 MHz
RAM:	128 Kbytes
ROM:	Self-test and boot ROM
I/O:	3 serial ports
Languages:	BASIC, Pacal, the usual CP/M things
Keyboard:	QWERTY, numeric and cursor pads, 'soft'keys
Display:	amber, 80 x 24, several fonts, emulates ADM-3a
Graphics:	Line graphics
Peripherals:	Choice of printers, modem
Expansion:	Hard disk
Best Points:	Ergonomic design, operating system
Worst Points:	No sins to speak of

Ratings:	**excellent**	**very good**	**good**	**poor**
Documentation:		✓		
Ease of Use:	✓			
Functionality	✓			
Support:	✓			
Value-for-money:	✓			

Options: **hard disk**

Price: **OC 8820 $5455 inc tax; MA8630 120 cps printer $1125;**

Review Unit from: Business Control Systems, 1 AngelPlace, Sydney 2000. Tel (02) 233 1302

Store It In The Archives

If you always thought archives were places to store old papers and forget about them, here's something to make you change your ideas. Les Bell reviews the Archives Computer...

MY FIRST impression as I started to lift the Archives onto my desk was that it was solidly built. As I straightened up I knew I was right.

I've always liked to look under the bonnet, so I removed the cover from the machine and took a peek. It certainly is nicely put together, from the monitor at the left of the console to the main board at the bottom of the cabinet. The power supply seemed beefy enough, and I couldn't bend the S-100 card cage at the back.

Putting the cover back on, I proceeded to power the system up, then read the manuals. The first thing I came to was 'Please read this manual before booting the system'.

The Archives III is one of the new breed of machines, which incoporate 13cm disks (limited capacity), but one of which is a Winchester hard disk (sigh of relief). With almost 5 Mbytes capacity on the micro-winnie, you're talking about something that competes seriously with 20cm disks.

Many hard disk systems do not boot off the hard disk; instead they require a floppy to be inserted which carries the hard disk boot program in place of CP/M. This then

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loads CP/M off the hard disk. Sounds complicated, takes a couple of seconds; this is the system the Archives uses.

The problem with hard disks is the number of files they carry. I typed 'dir' and watched the screen rolling past continuously for quite a few seconds. The extended directory utility revealed that there were 231 files on the disk using so many kbytes, with so many kbytes free. The problem was that the two figures did not add up to 5 Mbytes, and so I reasoned the machine was hiding something from me.

In order to make hard disks more manageable, CP/M 2.2 allows the assignment of user numbers. Each user can maintain a 'separate' directory — actually, it's the same directory with user numbers on the entries. By moving into user 1's area, I discovered more files, then in user 2, 3, 4 and so on. There's more to this than meets the eye!

The Hardware

The Archives is a big machine, robustly constructed — built like a battleship, one might say. The keyboard is attached via a coiled cord, allowing a fair degree of mobility and convenience for the operator.

The keyboard has the usual QWERTY complement, as well as a full numeric/arithmetic pad and a cursor pad to the left. The top row of keys are user definable, and on our review model were fitted with a neat overlay identifying WordStar functions.

The sculpted keys are well-organized, but I did notice one curious problem. The keys have slightly rough (probably deliberately non-slip) tops, and a typist with long nails will receive the most peculiar and unpleasant spine-tingling sensations. (I should explain that I play guitar, so leave my right hand nails long. I mainly used the Archives with my left hand. I'm serious!)

To the left side of the main enclosure is a 30cm green phosphor CRT with a pleasing 80 by 24 display. This screen emulates a Hazeltine terminal, although I noticed in the manual that Archives WordStar comes pre-configured and should not be re- installed for a Hazeltine. Presumably the Archives version uses direct memory access to speed up operation, or some such trick.

To the right of the screen is the microwinnie, and just below it a standard Shugart mini-floppy. At the back are connectors for serial and parallel printers/peripherals, as well as the power cord, keyboard cable and brightness control. The on/off switch is at the back too, requiring a bit of stretching to get at.

Above the connector panel is a removable plate which hides an S-100 motherboard. The main processor (underneath) is not S-100 — it's a single board computer — but it has the ability to drive S-100 boards, making expansion easy, particularly where such exotic interfaces as the

Specifications and Report Card

Unit:	Archives III
Made By:	Archives Computers
Processor:	Z-80A
Clock Speed:	4 MHz
RAM:	64 Kbytes
ROM:	Monitor and boot
Disk capacity:	780K floppy, approx 5M Winchester
I/O:	1 parallel, 1 serial port
Languages:	all the usual CP/M tongues
Keyboard:	sculpted QWERTY, with numeric and cursor pads
Display:	80 x 24 green phosphor, high quality
Graphics:	limited
Peripherals:	printer
Best Points:	Winchester disk, standard screen
Worst Points:	Weight

Ratings:	**excellent**	**very good**	**good**	**poor**
Documentation:		✓		
Ease of Use:	✓			
Functionality	✓			
Support:		✓		
Value-for-money:		✓		

Options:	**two floppies**
Price:	**$10,516 inc tax**
Review Unit from:	Australian Business Solutions

hard disk are concerned. I noticed that the hard disk controller, the floppy disk controller and the video board were all S-100 cards.

For the statistically minded, the CPU is the ubiquitous Z-80A and the beast has 64K of RAM. Although it's large, the Archives is quite pleasing aesthetically, and seems quite sound from an ergonomic point of view.

Some Good Software

The software on the review sample was nothing if not diverse. On user 0 of the hard disk, I found the IMS accounts receivable and accounts payable packages. IMS was, if my memory serves me correctly, the first Australian company to write accounting software, and its packages have been refined over the years.

The IMS A/R package will cater for up to 9999 creditors plus up to 999 sales dissections although, of course, one would require a hard disk to approach this capacity. The system integrates with the general ledger, as does the A/P package (which also integrates with the stock control data).

Incidentally, IMS also has a Word Manager System as part of its complete package, though this seems somewhat overshadowed by WordStar.

The system is menu driven with facilities for adding, modifying or deleting creditors, entering invoices, credit notes, and cash payments, and on-line account enquiry. It can also provide a range of reports as well as printing cheques and mailing labels. Full ageing is provided.

The general ledger is similar in operation. Full facilities are provided for creating a chart of accounts and maintaining the various files. Entries can be made in batches or through transfer of dissections from the other parts of the system.

The system allows the creation of budgets and the production of such reports as a comparative profit and loss statement. Standard reports include the chart of accounts, current and future transactions, standing journals, private ledgers, trial balance, profit and loss and balance sheet.

The accounts receivable and stock control programs are basically similar in style. All the programs are written in CBASIC2. The documentation is adequate, but doesn't compare with 'The Day of the Jackal' for entertainment value.

Moving up through the user numbers, I came across WordStar, with its MailMerge and SpellStar options. WordStar I know and love, MailMerge is nice too, but I'm afraid I'm less than thrilled with SpellStar. It is very much slower in overall operation than SpelGuard, and requires a lot more operator intervention.

The WordStar implementation on the Archives was very fast indeed; I suspect it may well be using direct memory access. The difference between half and full intensity was not great, however, making some menus look rather more disorganised than they are.

The next user had Supercalc in his user area. The implementation was fine, and the program worked just like it should.

User area 4 contained dBase II, the relational database system. dBase worked quite quickly with the hard disk; it is in applications like this that a hard disk comes into its own, as it is so much faster than a floppy.

One interesting point about the hard disk is that it did not seem appreciably faster than a floppy when loading programs. This is possibly due to its searching through a directory with several hundred entries, compared with the 50 or so common on a floppy. This speed difference would probably increase when loading large programs, however.

Also on the disk was Microplan, a financial modelling system. This is also sold under the Panaplan name for National Panasonic machines, and was reviewed in our March issue; those interested will find full details there.

The documentation supplied with the Archives was very good. An operators guide supplies the bare essentials needed to run the machine without bogging the user down in technicalities.

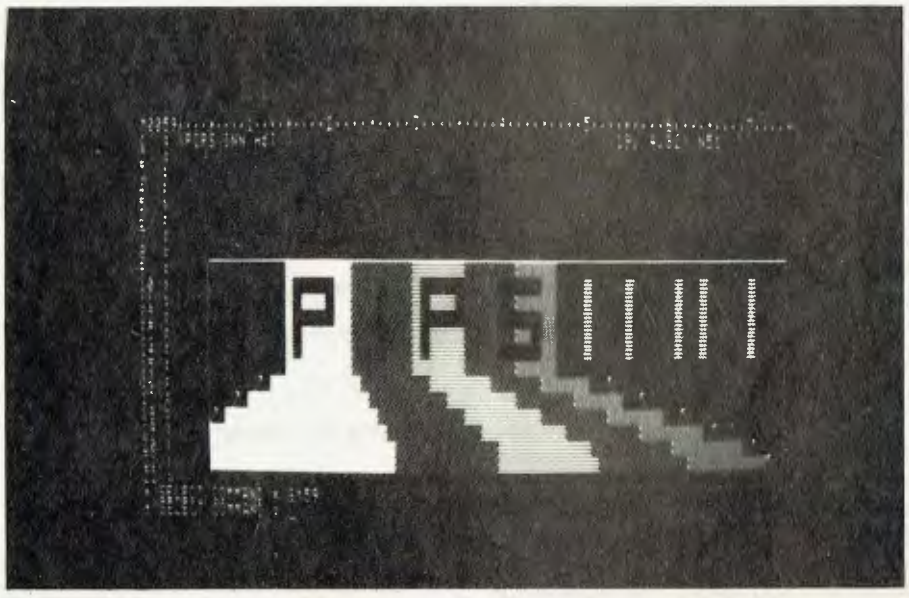
Additional sheets described the various utilities used to format the hard disk, recover backed-up files, and so on. The CP/M manuals are the Digital Research ones we've learned to live with.

Other manuals included the Supercalc and WordStar manuals (both excellent, especially WS since it's been re-written), the Microplan manual and dBase manual. Manuals for the IMS software were supplied in two binders.

The Archives is a solid machine, with a feel of quality to it. With its hard disk, it has capacity for fairly large business/commercial applications, and supports good software. □

Little Sord, Big Heart

Look! Up there in the sky! Is it a relational database? Is it a spreadsheet calculator? Is it a text editor? No, says Les Bell, it's virtually all of these — it's a...



Sord M23/20 Mark III with PIPS

AS EVERYONE knows, the Japanese can make mighty fine cars, colour television sets, hi-fi and computers; but there's one thing they've always had trouble with, and that's software.

That's why I was particularly interested to look at the new Sord machine, the M23. Not only is it interesting from the hardware angle, it is supplied with PIPS (Personal Information Processing Simplified) — probably the first major piece of software to emerge from the land of the rising sun.

The M23 is a go-anywhere, do-anything

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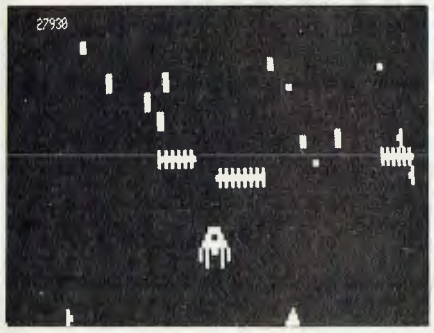

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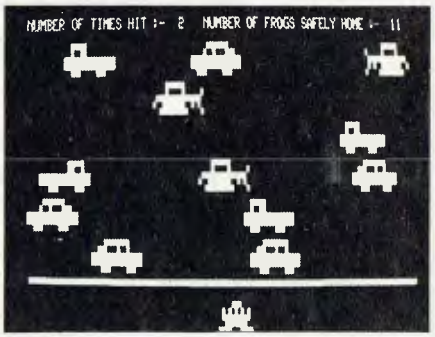

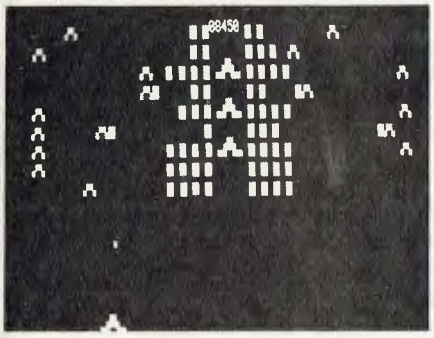

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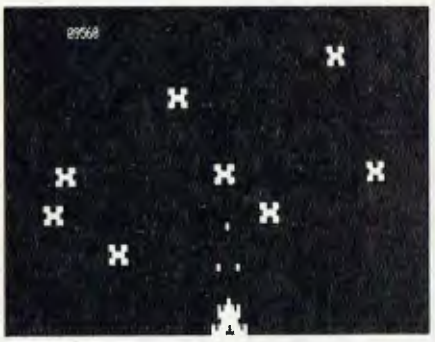

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computer. It's so light you can hold it in the palm of your hand, yet it contains a Z-80 processor and 128K of RAM — bigger than many mini-computers. It has a 92-key keyboard, which includes all the old teletype and QWERTY favourites, as well as a complete numeric and arithmetic operator keypad (even a 000 key), cursor control keys and user- definable keys.

The keyboard has slightly less travel than one is used to in a computer and feels strange at first, though after a couple of minutes I was able to 'Quick brown fox' at my usual speed with no errors. The screen leaves a bit to be desired, though; the character set does not have descenders, compromising readability somewhat.

Above and behind the right side of the keyboard are three expansion slots designed to take all kinds of optional extras. Most importantly, there's a disk controller (128K with no disks is just *too* much!), as well as a selection of plug-in ROMs and even a 640 character liquid crystal display.

The combination of ROM, liquid crystal display and a battery pack allow the M23 complete portability, to an extent one could hardly contemplate before (the LCD display will be available shortly).

On the back of the machine is a row of connectors for video output (b/w and colour), parallel printer I/O, and two serial channels. That's a reasonable complement of I/O for any commercial application.

For those who like to see what's under the bonnet, as well as kick the tyres, here's what's inside: the CPU is a Z-80A running at 4 MHz. There's page switching hardware allowing two banks of 64K of RAM, although the bottom 4K of the second page is used as video RAM. There's also 4K of bootstrap ROM (how did we ever fit a boot into a 1702 in the old days?).

Hanging off the video RAM is a CRT controller and 512 character ROM for the character generator. Also in the machine are a Z-80 SIO and CTC for the serial ports, a Z-80 PIO for the Centronics interface, and a keyboard interface.

A major part of the system is the FD20 dual disk drive. This handles a respectable 328 Kbytes per disk using 80 tracks. In use, the drive seemed to be pretty quick, but not outstandingly so.

Also supplied with our review system were a green screen (rather Sanyo-ish, but branded Sord), and a 120 cps printer with tractor feed. This configuration would be typical in a small office, whether used for executive planning or as an accounting system.

And The Software

The M23 Mark III comes with PIPS as standard. PIPS is, frankly, unlike anything I've ever seen before. Like a few software packages, it bears the stamp of one designer or a small team, who have created an integrated whole.

On the other hand, there are some areas where they've gotten carried away with themselves, although it is difficult to decide to what extent this is due to the design team's approach to life, and to what extent any problems are caused by translation into western language and thought processes.

PIPS is one of those software packages which can be tricky to master, but with continued effort, will reward the user by performing some amazing feats. In the short time in which I had the machine, I didn't reach that stage, but I could sense that if I could just unshackle my beer-pickled neurons and try a little harder, amazing things would happen. Perhaps I'm just too set in my ways...

Mitsui, the local agent for Sord, has done an excellent job of untangling the residual Jenglish that forms a kind of linguistic Sargasso Sea around Japanese computers, and is producing a work-book which is intended to form an introduction to PIPS. So, with the work-book in hand, I set about mastering the beast.

PIPS operates under, or through, Sord's own DOS, the details of which still elude me. In using these applications packages, one is rarely exposed to the DOS; only the programmers have to get their hands dirty, and that's probably just as well.

Under PIPS, the disk is organised as 76 pages, each of up to 50 lines of 74 characters. A page can contain any kind of

Specifications and Report Card

Unit:	Sord M23 Mk III
Made By:	Sord Computer Systems
Processor:	Z-80A
Clock Speed:	4 MHz
RAM:	128 Kbytes
ROM:	4 Kbytes plus optional ROM packs
I/O:	2 serial, 1 parallel ports, expansion i/f
Languages:	BASIC, Pascal
Keyboard:	QWERTY, numeric, cursor, function, funny feel
Display:	80 × 24 or programmable
Graphics:	Graphics character set
Peripherals:	Printer, 2 x 330 Kbyte diskete drives, monitor
Expansion:	Colour graphics, LCD display, battery pack
Best Points:	Lotsa RAM, low weight
Worst Points:	Jenglish manuals, short travel keys

Ratings:	**excellent**	**very good**	**good**	**poor**
Documentation:			✓	
Ease of Use:		✓		
Functionality		✓		
Support:	✓			
Value-for-money:	✓			

Extras Included:	**PIPS program**
Price:	**$6290**
Review Unit from:	Mitsui Computer Systems

data, either free-form, like English text, or tabular, rather like a spreadsheet. In addition pages can contain PIPS commands, allowing the system to run automatically.

Pages are read off the disk into a master buffer, the contents of which are displayed on the screen. On power-up, the contents of the table are random, but it does mean that the computer can be reset without dropping everything.

The screen display shows line numbers down the side and a ruler line across the top, rather like a spreadsheet calculator. The second line contains the page name, date and some other information about it. At the foot of the screen, two lines are reserved for command input.

PIPS commands are mnemonic, and not always evident from what you are trying to do. Some are easy: G for get (a page from disk), P for put, and to on. But to get a list of auto programs on the disk, AS;C is not immediately obvious, except, perhaps, to an inscrutable oriental mind. Nonetheless, practice makes perfect; I mastered WordStar's commands — this lot will be easy!

Generally, one will start a PIPS session by Originating (O) a new page. PIPS responds by asking for a title, and politely one supplies it. PIPS proceeds to enquire how many columns will there be on this page?, and on being told, prompts with 'COLUMN 1:'.

What is not immediately obvious to you, as a rank amateur PIPS user, but I, with hours of experience behind me, take for granted, is that the program wants to know the number of characters wide this column will be, and not what it will be called. Ah, the wisdom of hind-sight; that gave me a lot of trouble just a few minutes ago.

After supplying the program with the comment it requires, one is ready to proceed in filling in the table, and PIPS reformats the screen to show the columns, as well as moving the cursor to the top left-hand corner ready to accept the column headings. Once the headings are in place, PIPS presents the 'SELECT COMMAND' prompt again.

Now that the table has been created, the next step is to fill it in, using the MT (Make Table) command. The system asks 'APPEND ? (Y,N)', and if you respond with a 'Y' it moves the cursor to the end of any previous entries, ready for input.

Data can be either text or numbers, it matters not; and PIPS moves the cursor from column to column automatically, pausing at the ends of lines. Entry is terminated with the ESC key. This also has the effect of aborting commands or executing them with the options so far selected, if appropriate.

For example if, at the O command, one types ESC in response to the question 'HOW MANY COLUMNS ? :', PIPS creates a free- format page. In addition, if one knows the questions a particular command will 'ask', one can string them all together, separated by semicolons, like:

O;STOCK;3;12;8;8;STOCK ON HAND;DESC.;QTY;PRICE;MT;Y

This would create a simple stock record, and position the cursor ready to fill it in.

Using this facility, I was able to build up huge command lines, many of which did useful things, and some of which simply confused me.

Having filled in a page, one can do various things to manipulate the data thereon. For example, one can rearrange the columns and join the page with an existing page on disk, or move rows of data around.

At this stage, one can start to use the database-like features of PIPS. The CS (Conditional Search) command allows the user to search through a page, extracting only those rows in which a particular entry meets the associated condition. For example, a page of information on real estate can be set up, and PIPS used to extract only those properties in a certain price range or with an in-ground pool, and so on.

Criteria can be chained, so that one can search for houses under $75,000 *and* with an in-ground pool *and* in a particular area. All the time, PIPS keeps prompting for the input data, although if one is confident, it can be entered on one command line.

Now, the ability to search through a single page of data may not seem that impressive, but if these commands are combined into a file which can be run like a program, the system begins to take on a new dimension of power. Multiple pages can be searched, using multiple search conditions, in a manner that is transparent to the user.

One of the most powerful features of PIPS is its ability to do arithmetic. A simple calculation can be keyed in as a command; PIPS will perform the calculation and display the result on the next line. Similarly, individual entries in a table can be accessed and used in calculations, in a manner not unlike Visicalc et al.

However, the real power of PIPS is in its CAL command, which will total up entire tables in a single bound(?), and place the results in a buffer register, whence it may be recalled and inserted into a table as either a row or column. Using this facility, such applications as budgeting and forecasting can easily carried out by PIPS.

PIPS can drive the printer either by printing the master buffer or by selectively moving data into a subsidiary print buffer. Because of the tabular nature of most of the data PIPS manipulates, reports generally come out neatly formatted with no

intervention on the part of the user.

An interesting command is the graphics command, which allows the generation of graphs and bar charts directly from the page in the master buffer. The command prompts the user for all inputs, such as the highest and lowest values to be displayed, and then switches the screen to graphics mode. The resultant plots are neat and clean, and do not betray the meagre amount of user effort that went into them.

During the time I had the M23, I was not able to fully explore the PIPS commands and access the full power of auto- commands. However, the basic commands are quite simple, yet combine in powerful ways that can be intuitively grasped quickly. I suspect from this that an experienced user could achieve quite complex effects that would surprise the neophyte.

Other Applications

The M23 runs Sord's own DOS and BASIC, which was used on previous Sord machines. Mitsui has had a general ledger, debtors (with stock) and creditors for previous machines for some time now, and these have already been transported across to the new machine.

The system comprises three main modules — Invoicing/debtors/stock, generally the first area any businessman wants to get under tight control; Creditors/ general Ledger; and Payroll. The modules operate separately, so that some information entered into the invoicing system must be re-entered into the general ledger, for example.

The system operates on three types of file: Master Files, such as the Debtors Master File; Transaction Files; and Set-Up Files, containing installation-dependent variables. Data on master files is automatically updated from the transaction files during end-of-month processing, so that the master files always contain up-to-date information.

All the master files are accessed in alphabetical sequence, so that debtors, for example, are identified by name, and employees by surname. As mentioned above, the capacity of each disk is 328K, more than the old 8-inch single density diskettes which used to be standard for accounting applications, so capacity is not likely to be a major problem for small companies in the machine's target markets.

Mitsui's draft manuals for the system seem to be quite comprehensive, and suitable for the training of staff who are newcomers to data processing. The machine comes with a user's manual, an introduction to Sord's operating system, and an inch- thick BASIC programming manual.

Sord's implementation of BASIC is unique, and it's operating system was, frankly, all Greek to me; though that's not to say I couldn't master it in a couple of days if necessary.

The PIPS manual supplied with the system is written in that linguistic curiosity Jenglish, but is still quite clear and easy to follow. However, seeking to further improve the product, Mitsui has produced a tutorial book which gives simple examples of PIPS usage, and is also running day-long seminars at which new users can learn PIPS.

That PIPS is being taken seriously can be deduced by the decision of Citicorp's South East Asian division to standardise on the M23 and PIPS, despite that company's experience with Apples. Of course, PIPS applications are not confined to major companies, and the M23 would be a good choice of machine for the small company which wants to use a computer for both accounting and executive planning functions. □

Osborne's Porta-Power

Well, talk about your pocket rockets — this one has everything! For the price, there's just nothing on the market to touch it. LES BELL looks at the Osborne O-1...

IT'S A curious thing, but when I look at the Osborne, it reminds me of nothing so much as the old army 19 Set (Set, Wireless, No 19, British troops, for the use of) which was used so successfully in the North African Campaign in World War II.

I don't know why it touches off this nostalgia, I mean the 19 Set was a combined MF, VHF radio and intercom for tanks and armoured vehicles, while the O-1 is the latest in swish management tools/ executive toys, but there is a superficial resemblance.

Of course, the 19 Set was designed to take a pounding, while the Osborne only *looks* like that. I haven't had the courage (effrontery) to drop-test my borrowed O-1, but I suspect that it wouldn't stand up too well if used in a tank.

The outer case of the O-1 is made of some kind of plastic or grp, and is, in fact, slightly bendy. That is probably a plus, as it will help to absorb shocks, but on a more primitive level, it is somewhat alarming.

Opened up, the beige box reveals a keyboard (unfortunately not hinged to the main box as I assumed it would be) and a arger box which contains the works of the computer proper.

There's quite a lot crammed into the main cabinet. The CPU is a Z-80A, with 64K of RAM, and there are two single density disk drives with a screen between them. Along the bottom edge of the front panel are brightness, contrast and reset controls, connectors for modem, serial interface, IEEE-488, battery pack and external video.

Ah, yes, external video, and the much-debated 12 cm screen. Well, I have used it without any appreciable eye-strain, and I have shown it to others who, peering over my shoulders, were still able to read the screen. The big problem, in my opinion, is not the small character size, it's the alarming sideways screen scrolling whenever the cursor threatens to go off the screen.

When typing text under WordStar, for instance, as the cursor reaches the right-

Continued on page 82

Competitions For Computerkids

By Keith Stewart

ENCOURAGING the use of computers in schools is, in many ways, like the weather — there is much talk, but few do anything about it.

There are exceptions. The Liverpool Educational Region in NSW is lucky to have an active group of experienced teachers and advisers who share their knowledge and assist each other with the introduction of computer studies in schools.

January 1981 saw the first issue of BITS, their computer magazine for school students. BITS is published quarterly as a stand-alone magazine, and as an addition to 'Information Transfer', the computer magazine for teachers, published at Mitchell CAE, Bathurst.

Last year also saw the introduction of the Schools Computing Competition. This required the students to write programs to solve two problems.

The competition was a great success, with entries received from all over NSW.

Prizes were donated by companies whose executives are willing to help with promoting the use of computers in schools and throughout society. Commodore Australia donated a computer, and Nashua Australia some hundreds of dollars worth of diskettes.

This year, the competition is being run across Australia, and will offer a greater selection of prizes, including computers. Grahame Neal of the NSW Chapter of the ACS has promised the support of the ACS, and wide publicity is being given to the competition through posters and through computer stores.

Two programs must be written making the best use of the features of the type of computer used. The rules are simple:

1: Write a program to play a game of NIM against the computer. Our version of NIM is played with a set of fifteen objects (counters, matches, bug-eyed monsters or whatever); players take turns in removing up to three objects from the set. The player who removes the last object wins.

The program should allow the player to select whether the computer will play first or second.

2: Can Tony Barber be replaced by a computer? Write a program for a version of 'Sale Of The Century' in which the computer asks two contestants five questions. Don't forget, first in with the buzzer answers the question.

Feel free to use the full capabilities of your computer (language, graphics, sound and so on). Closing date is Friday, September 24.

CONDITIONS OF ENTRY

1. The contest organisers reserve the right to publish any entries.

2. Entrants must be full-time students at an Australian secondary school.

3. Entries must be the work of the entrant. Software packages may be used to enhance the program. Details of any packages used must be attached to the program.

4. Programs must be on floppy diskette or tape. It is preferred that Apple entries be on diskette and entries for all other computers be on cassette tape. These will be returned if return postage is included. More than one entry can be sent on one diskette or tape but indicate if this has been done.

5. All entries must be accompanied by an official LMTA Computer Competition entry form or a copy of the form.

6. Entries will be judged on: how easy and interesting the programs are to use; how well the program does the job; originality and creativity of programs; and how easy the program listing is to read.

7. Entries to be sent to: Computer Competition Secretary, Elderslie High School, Hilder Street, Narellan NSW 2567.

Entries must be received no latter than September 24, and should have proper documentation to enable the judge to run and assess the program. Entries must be accompanied by a copy of the entry form, properly signed by the Headmaster of the student's school.

Further information can be obtained from the school computer teacher. Teachers requiring more information should contact Keith Stewart on (046) 66-6406, or The Editor, BITS, Elderslie High School, Narellan. □

Be A Data Master

With Ashton-Tate's dBase II

One of the most charismatic computer terms, one guaranteed to drive many computer people into a dreamy haze, is database management system. Here LES BELL looks at one of the most popular database systems for micros — dBase II.

your computer

SOFTWARE REVIEW

AS MANY business users of microcomputers know, accounting packages, inventory programs and the like are not easy to use, and often involve major changes to the running of a company.

In particular, managers can't just pull a card out of a file to sort out what's happening; it's very difficult to interrogate many accounting systems to find out, for example, what the total outstanding from over-90-day debtors is.

There are several reasons for this, but one of the most obvious is that most accounting packages spread the information across a number of files, and have to recombine the information to produce the standard reports.

As soon as the user wants some information that isn't provided by a standard report, the trouble starts. The raw data may well be in the files, but a special program will have to be written to extract and process it.

A database management system, on the other hand, maintains all the data in one file — a database. The information is handled directly by the database management system, which runs the accounting, inventory and other programs in much the same way as a BASIC interpreter runs BASIC programs.

All the applications programs have access to all the data, which means that the data is updated immediately and data integrity is much better. Systems that have to update multiple files with duplicate data have a habit of sometimes losing 'sync'.

There are two basic types of database: hierarchal and relational. The hierarchal database is most common on mainframe computers and uses pointers and linked lists to maintain the associated data items. While this approach is very flexible, it is also very complex, and not really suitable for the humble 8-bit micro.

The other kind of database is the relational database. This uses a file structure that is fundamentally similar to BASIC: information is maintained as records, and each record contains multiple fields.

All accesses of the database are done through the database management program, which locates records by content or record number and fields by name. This makes manipulation of data very easy indeed. In addition, for complex operations, database systems allow programs to be constructed from their 'primitive' commands, with the addition of looping, conditional and other control constructs.

dBase II

Ashton-Tate's dBase II is a relational database system written in assembly language. It consists of a main program and several overlay files which are loaded into memory as required.

On power-up, dBase usually asks the user for the date, and then waits for a command, prompting with a dot. Usually the first command is USE filename, which causes the system to 'log-in' the file 'filename.DBF' as the database in use.

Now several commands can be used to interactively review or update the database. For example, one would normally use the CREATE command to set up a new database. After supplying the filename, dBase prompts the user to describe up to 32 fields by entering the name, data type (character, numeric or logical), number of characters width and, optionally, number of digits after the decimal point.

This information forms the *structure* of the database, and seems to be written out as the header of the database file. After the structure is described, the user is given the option of appending data to the newly-created database, and if this is done, dBase will switch into its append mode.

When appending data to a .DBF file, dBase displays a simple form on the screen, corresponding to the database structure. If suitably installed, it displays field widths in half intensity, allowing the user to anticipate field width problems and truncate or edit entries appropriately.

In this data entry mode, dBase also allows the user to edit entries using control key commands which are remarkably like WordStar's. Thus the user can enter control-G to delete characters, control-V to turn insert mode on/off, and the usual cursor control keys apply also. As a result, anyone who is used to WordStar's editing controls will have no difficulty with dBase's.

Data entry is remarkably simple. I showed dBase to a complete computer novice, who picked it up in about half an hour and was then quite happily entering data, going back and editing, and so on.

The whole process is conceptually simple and totally interactive: the RETURN key advances between fields, and when one record is completed the next is displayed. The record number is also displayed. An empty entry in the first field of a record will terminate the append mode.

Having created a database, dBase's other commands can be used to examine, modify edit and update it.

LIST, for example will list each record to the display. LIST NAME, PC will display just record numbers, names and postcodes, while LIST OFF NAME will list names alone (no record numbers).

The DISPLAY command can be used in a similar way, though it normally displays only the record dBase is currently pointing at. The DISPLAY ALL command operates just like LIST. DISPLAY NEXT 4 would display the next four records, while DISPLAY ALL FOR NAME < 'G' would display all records in which the name came after 'G' in the alphabet.

DISPLAY can also be used to examine the structure of a database, or to show the files on a disk. For example, DISPLAY FILES LIKE *.NDX ON B will show all the index files on drive B.

Positioning commands include GO TOP, GO BOTTOM, GOTO recordno, and SKIP. Records can be inserted anywhere in the database.

dBase will evaluate any expression on the command line. For example, the line ? 73/3.0000 will result in the display 24.3333. If dBase is looking somewhere in a name and address database, then ? NAME will print out the name.

Records may be marked for deletion, in which case they will be displayed with an asterisk against the first field. A subsequent RECALL command will 'undelete' them, while a PACK command will physically delete them from the database.

As well as the disk database, dBase can also manipulate variables in memory. This is done using the STORE expression TO variable and ? commands. Up to 64 variables can be held in memory at a time; while this may not seem like much, bear in mind that dBase is generally accessing the database, not memory.

As shown in the DISPLAY example above, many dBase commands can be modified by adding 'FOR condition'. Thus you can search the database quickly and easily, once you have some experience in phrasing just what you want. For example:

```
LIST FOR AMNT:DUE > '500' .AND.
BILL:DATE < '820101'
```

would list all those customers who owe more than $500 since before the beginning of the year. More complex searches can be done:

```
LIST FOR (JOB:NO = 730 .OR. JOB:NO
= 731); .AND. (BILL:DATE >
= '811101' .AND.; BILL:DATE <
= '820301')
```

would locate all records for which the bill date is between November 1, 1981 and March 1, 1982, for jobs 730 and 731. Notice the use of semicolons to extend the line, and the FORTRAN-like .AND. and .OR. operators.

The key to a good database system is fast access, and dBase allows this through the structuring of files as B-trees and the use of index files for access. The command:

```
INDEX ON CO:NAME TO CNAME
```

will create an index file (CNAME.NDX) which dBase will use to look up records in alphabetic company name order.

Indexed operation is very much faster than sequential searches. Once a database has been indexed, you can use the FIND command to find any entry in a matter of seconds. For example, once a file has been indexed on SURNAME, you can type FIND Smith and dBase will find the record in a second or so.

Then DISPLAY TITLE, CNAME, SURNAME, STREET, CITY would display the appropriate details.

As well as indexing, dBase allows databases to be sorted into either ascending or descending order on any field, and even allows multiple keys. Incidentally, INDEX will work on multiple keys also. LOCATE will find entries in non-indexed databases.

The SUM and TOTAL commands allow the consolidation of data from databases, while COPY and APPEND allow the transfer of data. dBase allows database files to be written and read in formats which are compatible with languages such as Microsoft BASIC and FORTRAN, as well as other processors such as WordStar's MailMerge.

The commands mentioned so far will allow the user to quickly search through a database for one-off jobs and to find information not provided by standard reports. However, dBase has a number of ways of providing much more sophisticated reports.

The REPORT command can be used to set up a report on the screen.

It prompts the user for various bits of information: page headings, column widths and names, headings, whether totals and sub-totals are required, and so on.

At the end of this dialog, the computer will print a properly formatted report, and the data is stored in a file reportname.FRM. Thus the same report may be generated at any time by just typing REPORT FORM formname FOR conditions.

The second major way of obtaining reports is through writing a program. In dBase, programs are really just sequences of dBase commands, with the addition of some control commands.

The command *MODIFY COMMAND filename* invokes dBase's editor which, like the record editor, behaves in a manner reminiscent of WordStar. Using this a command file can be written, which will be stored in filename.CMD.

The dBase instruction set includes nested IF...ELSE...ENDIF constructs, DO WHILE and procedures, in the form of other command files.

This means that dBase command files look rather like a modern structured language such as Pascal. Special functions are provided to allow single-character input (such as Y/N responses), INPUT of data to memory variables and ACCEPT, which allows string input without enclosing quotes.

Screen handling is very simple, through the use of the @ command. This allows such constructions as:

```
@ 2,30 SAY 'Input transaction data'
@ 4,10 SAY PART:NO
@ 12,4 SAY NAME + ', ' + ADDRESS
```

More complex and sophisticated screen handling is possible using the @...SAY...GET construction. Here, the @ positions the cursor, while SAY displays a prompt in half brightness. The GET part of the command displays the current value of the variable specified.

Once the screen has been set up, using ERASE to clear the screen, followed by a series of @...SAY...GET statements, the READ command will move the cursor back to the first field, allowing it to be changed, or left as is by simply hitting return. The cursor will now move on to the next field.

This is a very simple form of screen handling which allows non-programming users to design screens to conform to their existing business forms.

Command files can be built up to high levels of complexity, and the manual gives an example of a complete accounting system for a small advertising agency or art studio.

The programs handle bills (accounts payable), invoices, time sheets and salaries (including US tax), media insertion orders and client billings. The entire system was written by a user, and although it may seem elementary from an accountant's standpoint, it demonstrates a number of useful techniques.

dBase has a number of features which are just too complex to go into here, such as the ability to operate with two databases at the same time, the ability to join databases and to perform updates between databases. I have used it for one application, a sophisticated mailing list, and was almost literally amazed at the ease with which I had the application up and running.

One advantage of the database organization is that data entry was able to proceed even before the final data structure was decided upon.

The addition of extra fields was simply a matter of creating a new database with the appropriate fields and then copying from the old database. dBase keeps the fields in the appropriate order.

Likewise, I found dBase was easy to interface to WordStar MailMerge. After the database was created, it was simply a matter of giving the command 'COPY TO MLIST.DAT DELIMITED WITH ,' and dBase created the new file in the appropriate format for WordStar to read (including variable-length fields).

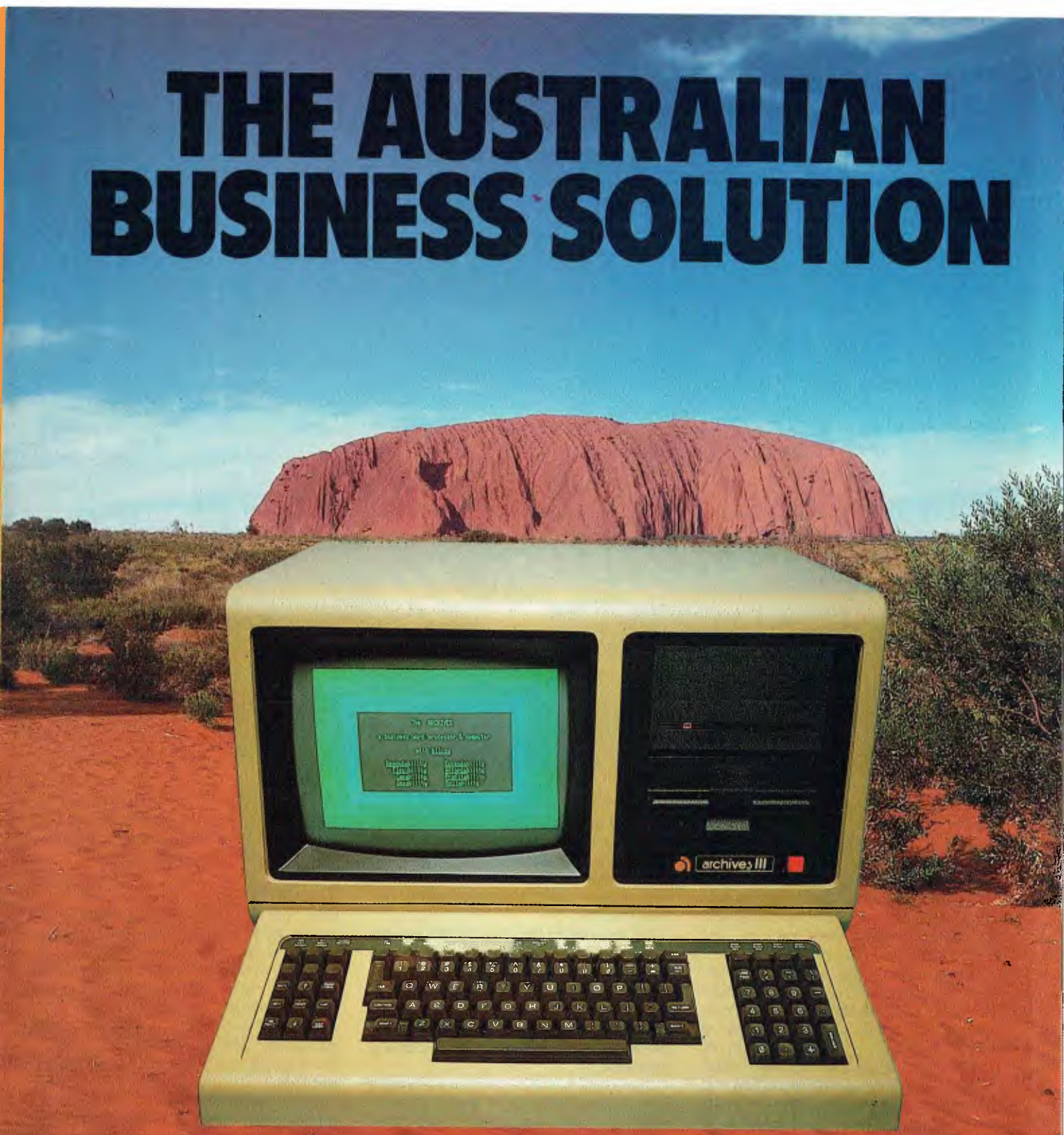
The dBase documentation is excellent. The manual is organised in two sections; a tutorial, which introduces the commands with examples, and a reference section which details the exact operation of each command, together with limitations and other reference data.

The examples are easy to follow, and the text is clear. An extremely comprehensive index is provided at the back of the manual.

My overall impression of dBase is that it is a very versatile piece of software indeed.

Its design shows a consistent attention to detail: for example, the similarity of editing commands to WordStar will reduce training time and increase productivity remarkably. dBase can take its place near the top of the range of high-quality business programs for microcomputers. □

THE AUSTRALIAN BUSINESS SOLUTION



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My Osborne And I

By Rasjad Moore

I'VE HAD MY Osborne-1 less than one month. My total experience with personal computers and word-processing is also exactly one month.

It started the day I brought this highly portable little wonder home to 'Yankee Hat' in rural Tharwa, ACT. And it is with this sense of wonder that I make my first foray into computer journalism.

Where to begin this odyssey? Yesterday. On a business trip to Sydney I stopped in at the Computer Galerie in North Sydney and picked up my first copy of *Your Computer*. I noticed an article (February, 1982) on the Osborne-1. Having been reassured by editor Les Bell that my intuition was not altogether misleading, I read on to "Make Your Hobby Pay — Write for Your Computer". And today, inspired, I am encouraged to fire up the old WordStar program and start writing.

My Osborne and I

Last November I was like most Australians. I had heard of personal computers. I had read a few stories about them. But my knowledge not only of computing but of the hardware was *zero*.

Then...a fast series of events propelled me to decision and the Osborne-1 that now sits before me as I keyboard these words onto the screen.

First came my close encounter with word-processing. We've all heard about it, but it's not until you personally come into contact with its awesome capabilities that you realise what word-processing can really mean.

It happened to me in my Public Service job as a clerk in Transport Australia. Then as I marvelled over the speed with which I got a very sticky typing job done, our librarian, Ken Devlin, gave me an annual review of Australian computers and I devoured all the stuff on word-processing hardware.

Just for the fun of it, I phoned a couple of WP dealers in Canberra and listened to what they had to say, a little embarrassed that I neither had the urgent need nor the money for their sophisticated and expensive systems.

However, one supplier not only sent me some catalogues but phoned me back. He found out where I stood — or should I say wavered — financially and he offered some options. That company, Anderson Digital Electronics, got me off and thinking; seriously.

So I became convinced I needed a word-processor. I could see many ways I could put it to personal use as a hopeful freelance writer in that "cottage industry" my wife and I dream of starting in order to shed off the Public Service and the hassles of working for other people.

The Cart First

But how to translate this need, this dream, into a system? Largely through my friendly librarian (who kept on feeding me trade information) I decided to make a big decision: buy a printer! Isn't this putting the cart before the horse? Possibly. But confronted with all the information about computers and associated equipment, I felt I could not yet make an informed decision.

But I did know that I wanted quality printing. My 'research' had shown that only daisywheel printers could give me the quality I would need in any freelance enterprise. Daisywheels offered the variety of type styles, clear, crisp impressions, and the speed and reliability I thought we would need. So my first purchase would be a good daisywheel printer. We would start growing from there.

Several models were available; three seemed of the same high standard — Itoh, Diablo and Qume. I selected the latter because ADE gave me the best reasons for purchase: ease of main-

tenance through a locally-based contractor, and a competitive price.

ADE also seemed interested enough in me as a beginner and 'amateur', so I didn't feel foolish asking obvious questions revealing my ignorance. I hope some salesmen are reading this: beginners need lots of emotional support. It's tempting to talk 'down' to people trying to scout new territory; such an attitude often takes the seeker to other stores and other salesmen.

In my search for a system that would do the job for me, I bore down on our local ComputerLand, Tandy, Boulevard Business Services, to name only a few, with questions about Apple II Plus, TRS-80, Commodore, Atari, Hitachi Peach and the rest. Some salesmen even put me on to competitive suppliers. That's how I found John Rose in Sydney, on recommendation from a competitor.

Like prospective motor car buyers, I had a thirst for information. I wanted to read about other persons with dreams like my own.

I began to haunt the Queanbeyan Public Library. Not a big library by NSW standards but a rare, regular subscriber to Creative Computing (USA). This is the magazine that last year featured an entire issue on word-processing, evaluating the many low-cost systems available through Apple, Tandy (Radio Shack) along with the multitude of software.

I found the advertisements more interesting than the articles. Frankly, I had no idea there was such a broad range of software already available for the personal computer!

Software Utopia?

When I started reading about the spelling/proof-reading programs now available from several software houses; when I saw that up to a half dozen suppliers could give me programs that would sort lists, develop indexes, tables of contents, store files of information, and merge files, I had that feeling inside that unless I got myself on this computer trip right away I was going to lose out on a lot of fun, to say nothing of the potential of making a little bread.

So I got ready to move on the next link in my system. With the Qume Sprint 9/45 standing by patiently waiting a mate, I narrowed my choices down.

I liked what Boulevard Business Services of Canberra had in the new Hitachi Peach. I almost ordered one. But there were aspects of the Peach which made me hesitant. I was attracted to its high technology; to the possibility of getting in on a computer that would grow in importance and popularity like Apple has in the States. But I decided I couldn't wait for the software, in spite of Peach's attractive word-processing package.

I had been attracted to CP/M since my first contact with Anderson Digital. Peter Ryan tried the NorthStar on me before he found out I couldn't afford it; he had even suggested I phone John Rose. By return post I had the Rose catalog, along with my first introduction to the marvellous world of CP/M.

That, along with my American reading about the Microsoft option for Apple — and envious examination of the two-page spread Lifeboat Associates puts in most American computer magazines on CP/M software — convinced me I could move faster and more securely with CP/M as far as my own needs and plans were concerned.

Boulevard Business Services of Canberra frankly told me that while CP/M options would probably follow Hitachi Peach's new wave of popularity I could not expect it for a while.

But there was a new American computer on the Australian horizon that might just fit my need. Stuart Ritchie then produced a little colour leaflet on the Osborne-1 and mentioned a price I found hard to believe.

CP/M, WordStar with MailMerge, Supercalc, CBASIC, MBASIC, all wrapped up in a little plastic case that might just fit under an airplane seat...for $2200! A few words were said about Osborne and Felsenstein. And I decided to take the plunge and ordered my Osborne-1 on the spot.

My early optimism has built into real joy as I have moved through the most memorable 30 days of my life.

My Osborne and I. We are good friends now. Getting friendly is something the old-time computer buffs have probably forgotten.

Stopped In My Tracks

The veterans take a lot of things for granted, things we earthlings have to learn the hard way; like manipulating two disk drives. I took my Osborne-1 home after work (having shown it off on my office desk to incredulous workmates). That night — with hat sense of excitement only a first computer owner can fully understand — I opened the hefty, door-stopper-like manual supplied and started to work on my new Osborne-1.

Within 15 minutes I was stopped! Right in my tracks! I could not get past the first part of the CP/M program setup and explanation. Couldn't get my file up on B drive. Tried, whimpered, cursed. No joy.

Saturday morning early I phone Stuart at Boulevard. He tells me to bring the machine into town. Here's where the Osborne-1 begins to shine. In a jiffy the keyboard is folded into the sturdy, shock-resistant plastic (yes, the catches are plastic, too) case and it's in the front seat of my Isuzu ute for the trip into Canberra.

Stuart is waiting with a 15-year old whiz with an IQ of about 160. I am quickly sorted out. In spite of Osborne author Thom's explicit instructions I miss some of the assumptions he apparently has made, including how to start a new file. Simple. Once you understand the assumptions.

Which got me to thinking about the whole problem of documentation. Here Osborne is offering about $1500 worth of CP/M software in one hit. You can see immediately the problem of cumentation, especially for the totally new, unwashed computer owner. Namely, myself.

So I then retackled CP/M and WordStar. Everything went more smoothly once Boulevard had put me back on the tracks. Yet I found it awfully hard.

I had that old feeling of being on the verge of understanding something, but not quite with it. I got a few samples printed out on my Qume (which Boulevard had thoughtfully helped me to interface: a snap with Osborne's SETUP program).. But I had a powerful need for more help than the Osborne manual could provide.

I found it in two unexpected sources. Last year when I first started exploring word-processing systems I met a nice lady selling the Archive, a dandy system but way out of my class.

She gave me a brochure (WordStar for the Archives) which I filed with all the other stuff I'd picked up from my phone calls around town. Having trouble learning WordStar I fossicked out this impressive brochure and found its explanation of WordStar and especially the command index a big help.

As I type this copy right now I have two pages of the Archives' publication pasted up in front of my monitor where I can quickly go to bold-faced editing commands for instant reference.

The Big Breakthrough

But my biggest discovery, and something that has marked a quantum leap in my understanding the Osborne and word-processing, was MicroPro's *WordStar Training Guide*.

Some software advertisers quote two prices: for example, $300/$50; meaning you pay $300 for the software and $50 for the documentation. John Rose of Sydney quotes $50 for the WordStar Training Guide, so I decided one bleak evening while trying to psych out my Osborne WordStar that I'd order one.

I began to really get serious. Unless you want many hours of frustration and guesswork, I strongly advise the WordStar beginner to invest in the training guide. It's designed for the *compleat idiot*, takes you by the hand, and leads you step by step through all the basics, up to and including some very complicated and sophisticated manipulations even I have presently no need to know.

People who buy the Osborne-1 should

know that they are not getting the newest version of WordStar. Even my dealer didn't know that. WordStar 3.0 is apparently the latest version out; Rose sells it along with this valuable training manual. But it's okay: with the 2.26 WordStar version Osborne offers only a few extras are missing, including a column-moving feature I probably won't miss. I figure I'm getting such a good deal with what I have in WordStar plus Mailmerge, I won't complain one bit.

So where does all this lead? First, to a new monitor. The little postage-stamp sized Osborne screen is okay for a while, but after you've spent a few hours at it you begin to feel a need for something bigger.

Boulevard Business Services got in the new Sanyo DM8112CX and convinced me it was the answer to my eye-problems. Boulevard supplies a little conversion plug for about $60. Just plug in the Sanyo and off you go after only a little fiddling. It's worth every penny you can squeeze out of your personal computer budget ($295). Not only is the 30cm screen easier with its green phosphor-on-black, but it fits nicely on top of the Osborne where you can work on it with convenience.

The little five-incher can be turned off. But I've found the big problem using the Osborne for word-processing is the 40 column screen. You adjust to its inconvenience; however with the monitor you've got to get used to moving the screen back and forth to see what you're doing. I figure I can adjust to it, since my Osborne is the only machine I really know. So I sometimes use both monitors (the big one on top; the little five-incher on the bottom): one to see where I am and the other for serious editing.

The advertising literature put out by Osborne's Australian agent — President Office Machines — says we'll soon have conversions for the Osborne-1 that will give us 80 columns (American writers tip an Osborne-2 model with all the updates later this year).

I must admit I am most eagerly awaiting the day I can go to 80 by 24. But for the moment, even with its slight inconvenience, I have little to complain about in my Osborne-1's word-processing capabilities.

President says improvements to come later this year will give us 'pioneers' not only an opportunity to upgrade with 80 by 24 column display, but double-density drives. I'll be first in line if Osborne is able to continue his price-breaking, Laker-like (and I use this cautiously) marketing style.

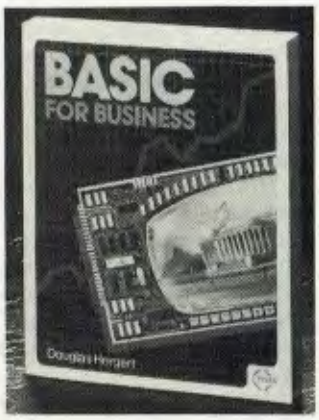
What I am eagerly awaiting is an opportunity to buy some of the optional software. Already, on the advice of President, I've contacted Lifeboat Associates, which is apparently converting CP/M shelfware to Osborne format. But we've been cautioned that it's possible to end up with several disks instead of the one original as a result of such downloading.

My needs are probably simple. I'll go for Documate Plus to handle my contents/indexing. I'll buy into MicroPro's SpellStar so I can build my own dictionary for proofing rather than rely on pre-packaged American vocabularies. And when the Osborne modem is available and I feel flush enough to get into the Australian Beginning, I'll be looking at Microlink, too. Maybe computer journalism will help foot the software bills.

Obviously, many of Osborne-1's unique software features are lost on neophytes like me. SuperCalc may offer possibilities, but I've got a lot to do with WordStar to pay off my present system.

I'm really envious of all those people out there in personal computerland who know how to manipulate BASIC and do their programming thing. I think of Carl, that 15-year old at Boulevard Business Services, who is already writing his own stuff; who is heavy into the whole trip. And I see these eager people on Saturday mornings at Dick Smith's or Tandy or ComputerLand and I know something's happening.

My Osborne and I: we're now a part of it, too. □



Business BASIC's

BASIC for Business, a new book by Douglas Hergert has been released by Sybex, a Berkeley (California) based publishing house.

The 250-page book is designed to teach the non-technical business person how easy it is to use a personal computer to complete general business tasks faster and more efficiently.

The reader will learn to write BASIC programs tailored for such business applications as sales reports, financial statements, graphs, charts, depreciation calculations and cost/volume/profit analyses. Realistic sample programs illustrate each element of BASIC, the most commonly used programming language in personal computing.

Exercises at the end of each chapter encourage the reader to explore new ways of using BASIC independently.

A special feature of BASIC for Business is a section whihc introduces three other programming languages: COBOL, FORTRAN and Pascal.

BASIC for Business costs $US12.95.

Also new from Sybex is

Executive Planning with BASIC,
by X.T. Bui

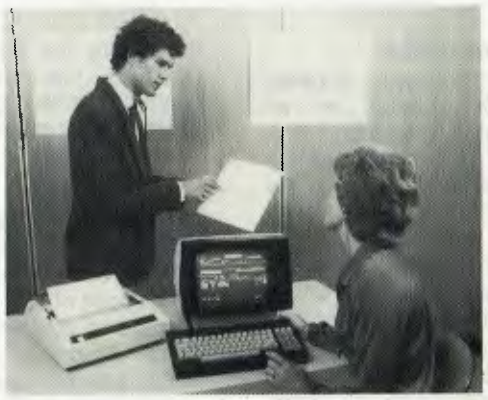
With this book, the business manager will learn to use a personal computer to dramaticaly accelerate decision-making and planning methods.

Up-to-date BASIC decision model computer programs for business management are presented including: Cost/volume/profit, Linear Programming, Inventory Management, Crtiicial Path Analysis and PERT, Exponential Smoothing, Linear and Multi-Linear Regression, Financial Ratio Analysis, Discounted Cash Flow and Portfolio Management.

The development, rationale and proper use of each decision model is carefully outlined. True-to-life application examples are always provided and problems are followed up and solved in sample runs of the programs.

Three valuable appendices complete the text: a summary of BASIC instructions; a collection of subroutines for matrix algebra; and a summary of the most important business statistics tools along with the BASIC programs that perform these algorithms.

The book costs $US12.95 from Executive Planning with BASIC, X.T. Bui
Price: $12.95 Ref. B380
ISBN: 0-89588-083-0
Sybex, 2344 Sixth Street, Berkeley, Cal 94710 □



Medical Management

"WITHIN five years 80 percent of the 25,000 medical practices in Australia will be equipped with computers."

This is the prediction of Maurie Stang, the marketing director of Regional Data Systems, a company which last October released CARE, a powerful computerised system for medical practice management.

Already installed in a number of practices, CARE offers a unique total solution to the requirements of practice management. It features full open-item accounting that includes instant or deferred billing and the production of monthly accounts. daily banking and the production of bank deposit slips and comprehensive practice management reports.

For patient management it provides a powerful patient detail retrieval, the history of all previous services given to the patient and patient registration for private patients, pensioners, repatriation patients and those for whom accounts are sent to employers, insurance companies or the Health Department.

CARE has the ability to have one or more users billing, receipting, enquiring or processing reports at one time.

Regional Data Systems was formed in 1981 by the joining of Dalton Sallis and Associates, a firm of leading consultants in the computer and management field, and the Regional Medical Group, an Australian-wide organisation specialising in health care. The company employs seven people.

The technical team is headed by David Dalton and Dr Philip Sallis. Dr Sallis is a well-known consultant and lecturer in management information systems. David Dalton was until recently national software manager for Prime Computers. He has had more than ten years experience in the industry.

CARE is written in COBOL and runs on the ONYX range of computers. ONYX was chosen because the computers will run in a reasonable office environment, because they have built a Winchester sealed fixed disk and a built in tape for back up and because they can be expanded to allow the system to be upgraded as the practice grows and the number of doctors increases.

In the future the company sees its computers hooked up to a national data network in which a central data bank will provide in-depth medical data to the general practitioner.

The practitioner through his computer, will provide to the data bank information on such matters as the prevalence in his area of specific illnesses or allergies.

For details, contact Regional Data, Systems, 84-88 Dickson Avenue Artarmon NSW 2064. □

Portable Office

BUSINESS people, students and professionals in all spheres could well be carrying their 'offices' with them by the year 2000 AD — in the shape of a lightweight electronic communicator no bigger than a small briefcase.

At least that's the 'office' envisaged by a team of British designers who have won a $1600 first prize in a competition sponsored by Philips Business Systems and the society of Industrial Artists and Designers to coincide with information Technology Year (IT82).

Simply by plugging in to the telecommunications network that is likely to be universal by the end of the century, the 'office' (which weighs less that 3 kg) can be a telephone, secretary, diary, timepiece, filing system, calculator and computer postal machine.

With keyboard, control buttons, loudspeaker, and small screen in the base and large screen inside the lid, it contains all the facilities for receiving, processing and transmitting written, graphic and voice material. Specific functions can be added to convert it into a thermometer, a drawing machine, laser surveyor, manometer or any other similar use.

The device came closest among the 30 competitors to the ideal of care and concern for human needs, imagination, ingenuity and understanding of the factors that enhance people's effectiveness that the competition judges were seeking. It was designed by a team of architects headed by Andrew Chadwick of the design firm Hulme Chadwick and Partners.

While this and the four other prize-wining designs go on show at various IT82 events around the country, real ones are about to be installed invarious government departments and large organisations in pilot schemes to explore the potential offered by the marriage of computer technology and advanced telecommunications systems. □

Up-Front Intelligence

FOLLOWING the success of other specialised computer-based point of sale and retail accounting systems, Sanyo Office Machines has released a further development which, Sanyo says, will find a major part of its application in the restaurant, hotel, bottle shop and accommodation industries.

The company has recently launched its ECR 720 intelligent stand-alone terminal, which has been developed in Australia with the specialised needs of the hotel/motel industry in mind.

Office machines' EDP product manager, Mr Roger Price, said, "because of the unit's unique design, it is almost infinitely expanable, having ben designed for RS-232 capability, which will be introduced later.

"The unit is extremely sophisticated, yet simple to program and operate, and is capable of carrying out any point of sale accounting function."

Apart from the ECR 720's use as a complete hotel front accounting centre, other immediate applications for the terminal in basic form are seen in service stations, and similar situations where it can employ its 64-department capability. An optional slip printer, model SMP 302, is also available.

"A total of 1024 PLUs are provided which can be identified by up to six alpha charaters and track up to 512 tables or hotel rooms," said Mr Price. "As an option, tracking can also be protected by an account number which incorporates a check digit".

Sanyo Office Machines believes while other similar terminals possess some of the features of the ECR 720, few, if any, have all the capabilities found in this new model.

Transaction keys are all completely programmable for several credit cards, cash and cheques.

"In fact the flexibility of the ECR 720 actually lets the user design his own cash register to carry out thoe functions of prime importance to his particular type of operation," said Mr Price.

The ECR 720 is said to be competitively priced, with the basic system available for under $2000.

Information and application data on the ECR 720 is available from Sanyo Office Machines on Sydney (02) 929 4644, or from branch offices in all capital cities, and Darwin and Canberra. □

Anaconda Expands

PERTH—based software house Micro Solutions has developed a system to provide mineral exploration company Anaconda Australia the ability to streamline collation, assimilation and presentation of the enormous amounts of data which result from laboratory testing of drilling samples.

Called GEOTIS (geological/geophysical technical information system) the software was written on the computer aided design and drafting system Easinet.

The GEOTIS system is available to other mining companies, either to access through Micro Solutions' online bureau service based in Subiaco, WA, or to run on users' own computer systems.

Anaconda's system is being developed in two stages. When complete it will enable geologists in the field to send in samples, have them processed, and to receive the results numerically and graphically far more quickly than was possible previously. Decisions regarding drilling sites will be able to be made on a day to day basis, despite remote locations. The efficiency of field operations will be greatly improved.

The Easinet system was selected because it had the most powerful graphics capabilities available to handle Anaconda's requirements and was an economical solution, according to Micro Solutions.

"Designed to provide the interfacing of a variety of graphic peripherals, of varying costs and able to be tailored to suit specific needs, it is a flexible CAD system able to support a large number of different functions on a relatively small computer," sys Dr Barry Westlake, the designer of the system.

Dr Westlake said there is a current tendency for purchasers of CAD equipment to buy products unnecessarily sophisticated for the job they are to perform. □

ITT Colour Terminals

A NEW four-colour visual display terminal supplied by STC's Computer Product Division has been released in Australia.

Designed for compatibility with the larger IBM computers, the 2790 was first landed in December. By the end of March, close to 200 units had been sold.

The four-colour display presents data more clearly and concisely on the screen, making it easier for operators to absorb information. Colour is generated by the existing field attribute byte and makes no demand on mainframe computer memory.

The ITT Courier system operates through advanced terminal controllers (ACTs) in two sizes — for up to 16 or up to 32 attached terminals.

The 2790-2A terminals offer 1920-character display on a 20cm by 27cm high-resolution screen. □

Digital & Anderson

DIGITAL Equipment Australia has announced that it has again renewed its agreement with Melbourne based company Anderson Digital equipment for the resale of its terminal products. This is the fifth successive year that the two companies have entered such an agreement.

The new agreement is the largest ever signed between the two companies and is estimated to be worth well over $3 million to Digital equipment.

Commenting on the agreement, Werner Faets, terminals business manager for Digital in the South Pacific Region said: "We are paricularly pleased at the phenomenal growth of our terminal sales and delighted to be associated with ADE which more than any other of our resellers has contributed to our vast growth in this area through consistent and aggressive marketing. The new management team at ADE has reinforced our confidence that this year will set new records for our products and, to assist in this effort, we have assigned a dedicated management team to ADE's account."

According to Jim Gallagher, ADE's general manager, Digital's terminals products represent a large part of the reseller's total turnover. □

Time Recording System

ONE of the world's largest insurance companies has become the first purchaser of new equipment for the microprocessor control of time attendance recording and flexible working hours.

The system, known as Plantime 4, has just been installed in the offices of American International Underwriters (Australia) and its sister life company, Australian American Assurance Company.

This represents the first Plantime 4 sale for its new distributor, Bell and Howell Australia, which set up a time systems division to market the advanced equipment.

"AIU has now become the first company to install systems in all State capitals," said Mr Bill Cutbush, managing director of Bell and Howell Australia.

He said the $46,000 sale broke new territory for his company, which had aligned itself primarily as a national information systems supplier.

AIU personnel manager, Mr Alan Francis, explained that the company was not merely looking for just another time recording system.

"We are seeking a system with the ability to be interfaced with computer equipment and Plantime 4 certainly appeared to fulfil that requirement," he said.

"While most of our people will be on flexible working hours, we will (because of the nature of our industry) still have some on varied and unusual hours. The new electronic system is coping with all these staff members quite easily," Mr Francis said.

AIU is planning to update its computer facilities later this year and will at that time interface Plantime 4 with the mainframe to obtain interpreted data for payroll — like hours worked, variances from standard and absentee information, sick, study and annual leave.

Bell and Howell Australia's Plantime sales manager, Mr Jim White, believes the new electronic time recording system is an economically viable proposition in a flexitime or fixed hours situation with a staff from about 20 persons.

He said the prospects in the marketplace included Government departments, airlines, financial institutions and almost any general office. □

YOUR NEW MITSUI PERSONAL COMPUTER.

A system so complete it even has its own 'instant' software.

When we say complete, we really mean it. The Sord M23 includes keyboard, monitor, floppy disc drive and printer which is ready for action the moment it's plugged in.

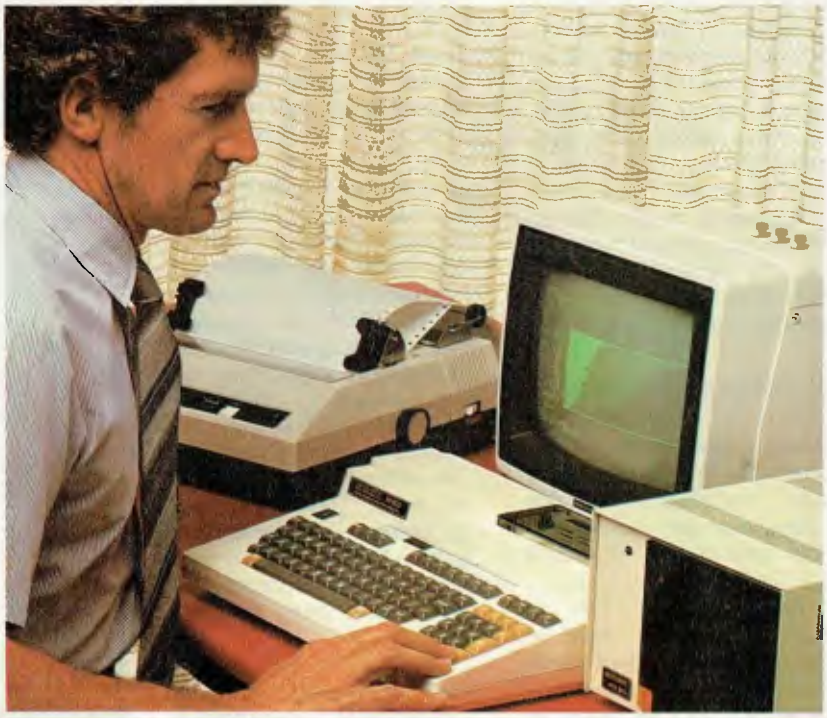
Another surprise is PIPS. Personal Information Processing Simplified has made programming for everyday business tasks obsolete. It simplifies problems in a fraction of the time it takes other incomplete systems.

In addition to PIPS are application packages written in Australia for Australian conditions. These interactive packages handle everything from Debtors, Invoicing, Stock, Creditors, General Ledger to complex Payroll problems.

Other big features are the 128K-Bytes of internal memory, the largest for an 8-bit microcomputer; and the M23's almost unlimited expandability.

In fact the only micro feature is its light-weight physical size.

The M23 is remarkable value. $6,290 buys you the complete system with PIPS and a full days training. Available from a continually expanding network of dealers Australia-wide.



SORD M23

Simply gets down to business.

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J&N 3858

First Delivery

SYDNEY company Specialised Computer Services is the first recipient in Australia of the Digital Equipment Personal Office Computer Option, the VT18X.

This option upgrades the popular VT100 video terminal to a stand-alone personal office computer.

SCS, a software house, will be using the computer to format software application packages.

Jim Fisher, SCS Managing Director, said: "We expect the Digital Personal Office Computer to have great appeal, in particular for the small businessman running general accounting applications, as well as word processing, and specific applications such as financial modelling."

In handing over the first unit, Mr Bob Hill, Director of General Terminal Company, commented that the VT18X option was the only alterntive for the 7000 VT100 users Australia wide when they are contemplating personal computing.

For futher information contact Bob Hill at General Terminal Company, Suite 201, 109 Alexander Street, 2065, or telephone (02) 439-8644. □

Move To Micros

AFTER EIGHT years of consulting to users of mainframe and minicomputers Cycom Computer Systems is extending its services to cover micros, specialising in business systems.

As well as consultancy at all levels it offers a variety of programs carefully selected from the vast range of CP/M compatible software. These include packages to perform relational data base management, financial modelling, critical path analysis, word processing and spelling verification.

Utilities for customising CP/M and verifying disk media are also available. In addition to these 'stock' lines almost any CP/M package can be obtained.

Software demonstrations can be arranged and all packages are supported by Cycom, located at 178 High Street, Windsor, Victoria, 3181. For further information contact Monty Jaboor on (03) 529 3029. □

Anag and the Computer

by Peter Flanigan

"I SEE you've got yourself a computer," said Anag as he climbed down from his flying saucer.

"How did you know that?" asked Jason in surprise. His father had brought home the new computer only yesterday. It was just barely out of its wrappings.

"My new scanner — I've just had it installed," replied Anag. "It's much better than the old one — sees through brick walls with no trouble."

Jason was used to Anag's technological wonders by now. He was always coming up with something amazing.

"Do you know all about computers, Anag?" he asked. "Of course I know all about computers," Anag replied. "On Titan we've had them for thousands of years."

He pressed a button on his remote controller and the saucer shimmered and faded from view until only the merest shadow could be seen.

"Mind you," he added, turning to Jason, "this one looks a bit primitive."

"It's the latest model," protested Jason.

"The latest model on Earth, you mean," responded the little Titanian. "Never mind, you've got to learn to crawl before you can walk."

"Could you show me how to work it?" asked Jason eagerly. "Dad was going to, but he said he won't have time until the weekend." "Huh! Typical!" snorted Anag. "Probably doesn't know himself. Well, let's have a look".

They went into Jason's room, where the computer was sitting on a table in the corner.

"Ah yes," said Anag. "Elementary." He checked the plugs at the back. "All connected up I see. Good. All we have to do is switch on here and here and — Tongale! — it works."

"But nothing's happening," said Jason as he stared at the blank screen.

"What do you expect to happen?" asked Anag.

"I don't know — something — some writing or pictures or something."

"There's no program in it," said Anag.

"What's a program?" asked Jason.

The Titanian stared at him for a moment.

"Okay." he said, "I see we have to start from the beginning. Just hold on a moment."

He took out a small silver disc — his communicator he called it, Jason re-

"You must understand that computers are dumb!"

membered — and spoke rapidly into it in his own language. Almost at once there was a reply in the same language. Anag spoke briefly again and then put the disc back into his side pocket. "What was all that about?" asked Jason.

"Just receiving clearance for an extended visit," replied Anag. "I was due back up top in 15 minutes. I told Toto I had some minor repairs to carry out."

"Who's Toto?"

"The operations O.C. — he's a computer acutally, very easy to get around if you know the right noises to make. Right, let's get started on this."

He sat down in front of the computer. Jason drew up a stool and watched him with interest.

"The first thing you must understand about computers," said Anag, "is that they are dumb."

"Dumb!" said Jason in surprise. "But I thought...."

"You thought they were super-brains?" queried Anag.

"Yes."

"Well they're not," said Anag. "They're just dumb machines."

"But how come scientists and astronauts and people like that use them for...for space ships and things like that?"

"How come your bicycle's got wheels?" asked Anag.

"Of course it's got wheels," replied Jason. "It wouldn't go without wheels."

"Neither would a space ship go without computers," said Anag. "Look," he continued, "a machine is something invented by a human — or more likely a Titanian, because we're a bit smarter than humans — to help him do something he wants to do. The first machine ever used was probably a lever, to lift a heavy rock or roll over a log. Is a lever strong?"

"A lever isn't really strong," answered Jason, "but..."

"But a man with a lever is stronger than a man without a lever, right?" asked Anag.

"I suppose so," agreed Jason.

"Of course he is," continued Anag. "Why if I had a lever long enough, I could stand on Titan, use the Moon as a fulcrum and move the Earth."

"What would you want to do that for?" asked Jason, rather amused by the idea.

"Well, it would make old Archimedes happy, if nothing else," replied Anag.

"Now there was a super-brain if you like — even if he was a human. Anyway, all I'm trying to say is that although a computer itself isn't smart; a man with a computer is smarter than a man without a computer."

"That's if he knows how to use it," said Jason.

"Precisely. Just like your bicycle. There's a story I remember about the King of the Lakkas and a bicycle."

"Who's the King of the Lakkas?" Jason asked.

"The Lakkas are a backward group of people on a remote part of Titan," replied Anag. "They have a reputation for being stupid. Lot of jokes are made up about them."

"Sounds like the Irish jokes we have," said Jason.

"Could be," said Anag. "Anyway, the King of the Lakkas had heard about the bicycle but had never seen one. One day he was sent one as a present from a neighbouring country. He was told that with this he would be able to go faster than the fastest runner in the kingdom."

"The King was immensely pleased and arranged a challenge race between the local champion athlete and himself."

"What happened/" asked Jason.

"The King lost, naturally," said Anag.

"Why?"

"Because he wasn't a very fast runner and he was even slower when he had to push a bicycle as well!"

"But why didn't he ride it? asked Jason.

"I guest he didn't quite get the point of the exercise," replied Anag. "After all, remember he had never seen one before. Anyway, the same idea goes for any machine — lever, bicycle or computer. It's useful if you know how to use it, otherwise it's just so much junk. Man plus machine plus skill and knowledge, that's the combination which really gets you places. How long did it take you to learn to ride a bike?"

"Three days," said Jason, "And I fell off about 20 times." "Naturally. And you'll probably fall off the computer a whole lot more times than that," said Anag.

"What do you mean fall off the computer?" queried Jason. "You don't ride a computer."

"No, you don't actually ride on it," agreed Anag, "but you'll soon see what I mean."

"Could a computer ride on a bicycle?" asked Jason.

"With great difficulty, I imagine," replied Anag. "And it doesn't have quite the same self-repair facilities as you do — not this model, anyway. Well, are you ready?"

"And waiting," said Jason.

"Right. I'm going to enter a short program just to prove to you how dumb this computer really is. You'll have to be a bit patient because these funny Earth keyboards take some getting used to."

"Jason watched with great interest as the little Titanian, using only two of his eight fingers, typed in as follows:

```
NEW
10 PRINT "ADDITION BY  COMPUTER"
20 PRINT
30 INPUT "ENTER FIRST NUMBER  "N1
40 INPUT "ENTER SECOND  NUMBER "N2
50 PRINT
60 PRINT N1"+"N2"="S
70 END
```

"What does it mean PRINT by itself?" asked Jason. "Nothing. It just leaves a space."

"What are the numbers at the beginning — 10 and 20 and so on?"

"They are called line numbers," explained Anag. "Every instruction is a line and every line must be numbered in order."

"What is N1?" asked Jason.

"It stands for the first number," answered Anag. "Have you studied Algebra?"

"No. You only do algebra in high school. My sister does it. It looks pretty funny."

"It's funny enough, I suppose," said Anag. "Depends on your point of view. When do you go to high school?"

"Next year," replied Jason.

"Oh well, never mind about the Algebra, just think of labels. N1 and N2 are labels for the two numbers. Come on, try out the program."

"How do I make it work?" asked Jason.

"Type in RUN and press the return button," said Anag.

Jason typed RUN and pressed return as instructed.

```
ADDITION BY COMPUTER
ENTER FIRST NUMBER ?
```

popped up on the screen.

"Now type in a number," said Anag. "Any number will do."

"23?" queried Jason.

"Yes, that'll do."

Jason typed in 23. Nothing happened.

"Now what?" he asked.

"Press return — you always press return to show you've finished," Anag told him.

Jason pressed return.

```
ENTER SECOND NUMBER ?
```

said the computer.

"Now type in another number."

Jason entered 34 and pressed return.

```
23+34=0
```

was the response.

"23 plus 34 equals zero. Eh?" exclaimed Jason. "That's not right."

"No, it's not," agreed Anag.

"Doesn't it know the right answer?"

"No," replied Anag.

"Wouldn't it even know 2 plus 2?"

"Try it."

"How?" asked Jason.

"Type RUN again," answered Anag.

Jason repeated his previous actions, but this time he entered a 2 for each number.

```
2+2=0
```

said the computer.

"The Lakkas have a reputation for being stupid. . ."

"What a dumb computer," said Jason.

"I told you it was dumb," replied Anag.

"How can I make it do the sum properly?" asked Jason.

"Type LIST," instructed Anag. "L-I-S-T. Now return."

Lines of print appeared rapidly on the screen.

"What's happening now/"

"It's displaying the set of instructions I typed in a minute ago," said Anag.

Jason saw the lines Anag had typed were now back on the screen exactly as before.

"Look at line 60," said Anag. "There I told it to print the two numbers N1 and N2 with a plus sign between them and an equals sign following. I also told it to print a number called S. The trouble is the computer hasn't been told which numbers S stands for. So, to play safe, it prints a zero."

"Can't it read?" asked Jason.

"Not really, not what you would call reading," replied Anag.

"It's really really dumb, then?"

"Like I said," said Anag.

"How can you make it understnad what to do?"

"Spell it out in words of one syllable," said Anag. "I'll show you."

He typed:

45 S=N1+N2

"Now I'll ask it to LIST again."

He typed LIST, return, and Jason saw line 45 had been added between lines 40 and 50.

"You can always add extra lines to you program," said Anag, provided there are spare numbers. That's why it's a good idea to use 10, 20, 30 instead of 1,2,3 for your line numbers.

"Will it work now?" asked Jason.

"Try it!"

Jason typed RUN, return.

"Now enter your numbers."

Jason entered a 3 and then a 4.

3 + 4 = 7

said the computer.

"Hurray!" cried Jason. "You very clever computer."

He tried it again, entering 20 and then 30, not forgetting return each time. Nothing happened.

"What's wrong?" he asked

"You just fell off you bicycle," said Anag.

"What did I do wrong?"

"You forgot to type RUN before you started."

"What can I do now?"

"Type RUN."

Jason typed RUN.

ADDITION BY COMPUTER
ENTER SECOND NUMBER ?

appeared on the screen.

"Eh? What's going on? Why is it saying enter second number?" asked Jason. "I haven't entered the first number yet." "Oh dear," said Anag, "you really blew it that time. Not only did you forget to type RUN, you wiped off half your program."

"How did I do that?"

"LIST it and I'll show you," replied Anag.

When the program was listed Jason saw lines 20 and 30 were missing.

"What happened? " he asked.

"What happened," said Anag, "was that you typed 20 return and then 30 return. If you do that before you type RUN, lines 20 and 30 are deleted; wiped out."

"Can I put them back in?" asked Jason.

"Easily," said Anag. "20 was just PRINT, 30 was INPUT "ENTER FIRST NUMBER "N1. You type them in."

Jason picked out the keys slowly, aware his typing skills could be improved.

"Don't forget the inverted commas," warned Anag.

"You mean those speech mark things?" queried Jason.

"Yes," said Anag, "those speech mark things. They are vital. If you make a mistake use the backspace or else press return and retype the whole line."

When he finished Jason typed RUN. This time it worked perfectly. He entered 123 and 65.

123 + 65 = 188

said the computer.

"Does that look right to you?" asked Anag.

"Yes, it's exactly right," replied Jason.

"Good," said Anag, "because it's time for me to go. I'll just show you two things more before I do and that will have to do for this time."

* = multiply
/ = divide

"Use those two symbols instead of the ordinary ones and you'll be able to do any problem you like. Try them out for yourself. Goodbye, I must fly."

Jason followed him to the back door.

"Oh, and don't forget the Rule of Order," shouted Anag over his shoulder.

"Rule of Order — what do you mean?" called Jason.

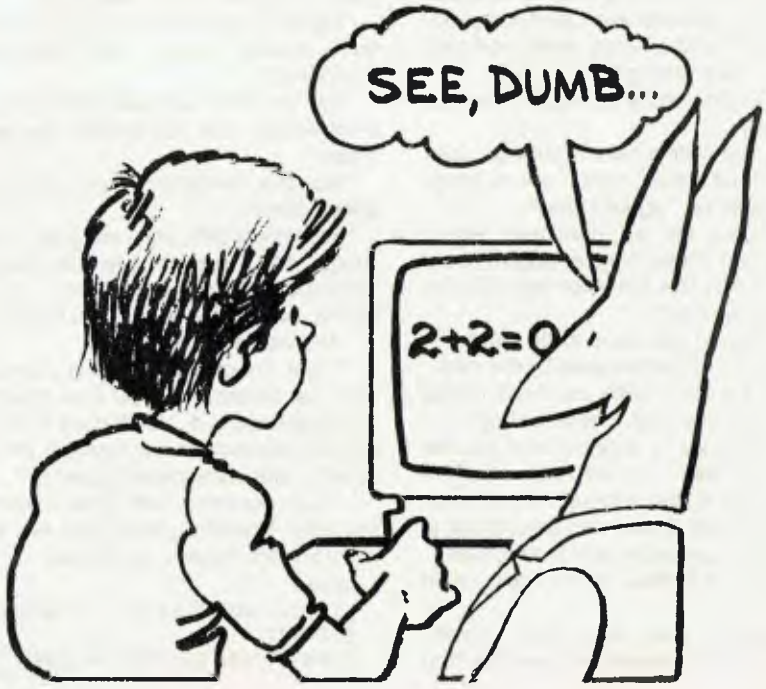
"If Order doesn't rule, Chaos takes over," yelled Anag from the bottom of the garden. "Ask your maths teacher. See you!"

Jason watched as the Titanian scrambled up the side of his saucer and climbed in. There was a whir and a flash and the flying machine rose vertically to a height of about ten metres, and then shot off at great speed.

He went back inside. He wasn't sorry to see Anag go this time. There were lots of things he wanted to try out on the computer. And, as he thought to himself, if I'm going to fall off lots of times, I'd rather do it when no-one is watching! □

**Peter Flanigan is a maths teacher in Western Australia. He wrote this story from his experiences in introducing a group of 10 to 12 year olds to computers.*

Oh yes, when "Anag and the Computer" arrived at the office, the YC staff — publisher, editor, sub-editor and janitor — sat back after reading it and said "good story" just loud enough for the rest of the office to ask what about the story. Think of a primary schooler you know and we think you'll agree....



your computer text file

Overseas Purchase

I WOULD be very grateful if you could answer the following questions for me. I'm going overseas for a short time and might pass through Hong Kong or Singapore. I will also be visiting the UK and USA.

Will I be entitled to purchase a personal computer when overseas, and avoid import and custom duties?

Also, will a computer bought overseas work in Australia (assuming the voltage is okay) on an Australian television?

If so, will it work in colour?

If not, can it be adapted here in Australia, and would the cost of adaptation be so high that the purchase wouldn't be worth it?

If it can be adapted, do you know of anyone in Brisbane who could do it?

What this all boils down to is: Is it worthwhile buying a personal computer overseas?

M HARRIS
Bardon, Qld

In answer to your questions: Yes. Yes, if bought in UK. Yes, but sound may not be okay. Can't be economically adapted. No. No.

Coveting A Neighbour's...

MY 12-year-old son came back from Sunday School recently with a piece of paper on which was written the Ten Commandments. He felt they lacked a certain modern quality, so he did a slight rewrite.

As you publish humorous material, he suggested that you may like to use his idea...Hope you do.

The Ten Commandments (Revisited):

1. Thou shalt not have abacuses or calculators before me.
2. Thou shalt not take the name of thy computer in vain.
3. Remember that thou keep holy they keyboard.
4. Honour your computer and the State Electricity Commission.
5. Thou shalt not kick thy computer in the teeth.
6. Thou shalt not connect thy computer via modem to an incompatible computer.
7. Thou shalt not embezzle *Your Computer*.
8. Thou shalt not input thy neighbour's computer with false data.
9. Thou shalt not covet thy neighbour's bytes.
10. Thou shalt not pirate thy neighbour's software.

JOHN 'MOSES' GUTH
Galong, NSW

A Mistake! Who, Les?

I THOUGHT I should bring your attention to a mistake which is probably a typographical error in an otherwise informative article.

In Les Bell's Assembler article, (February *Your Computer*, page 64) he mentions that we cannot access registers W and L. He of course means registers W and Z.

Keep up the good work!

CRAIG DELAHOY
Endeavour, Vic

Telecom And Prestel

YOUR editorial in December's issue is rather surprising when you suggest Telecom — a public monopoly, socialistic bureaucratic organisation — could offer a service (Prestel) to the public quicker and cheaper than private enterprise!

Coming from a private enterprise organisation, this is doubly surprising.

All my experience with public utilities leads me to believe they are slow, costly, inefficient and the service is indifferent. Mostly we regard monopolies as undesirable and as the enemies of initiative and real progress.

I suggest to you the Minister for Communication has acted wisely in blocking the future octopus-like expansion of Telecom into Prestel and that we will benefit from the energy and enterprise and incentive that flows from the private sector being allowed to exercise its reasonable rights by becoming involved.

No doubt you have heard the story that if a communist power were to take over the Sahara Desert you would find within 18 months or so that there would be a shortage of sand.

L K APPLETON
Woodridge, Qld

Certainly there are many Government-owned utilities that run at a loss. However, when the Government is presented with an obvious money-spinner, like Prestel, surely it is in the interests of the stockholders (taxpayers) that the Government take advantage of the deal — Ed.

Well Done, But...

I HAVE been reading *Your Computer* since the third issue and I congratulate you for a job well done. But...

I have a TRS-80 Pocket Computer, and I can only deplore the fact that, apart from articles describing these machines when they came out, there is not a "Pocket Computer Corner".

I assume it could be due to the lack of contributions from readers; if that's the case, are you interested in publishing programs for Pocket Computers — I have many of them on games, mathematics, astronomy and so on.

By the way, it was the article "Write for *Your Computer*", published in February that prompted my inquiry.

CLAUDE COLLE
Ingham, Qld

We're interested in anything our readers would be interested in, although the formula is complicated by availability of material, requirements of space, and the fact that the biggest interest groups must get the biggest share of the magazine.

Given those limitations, we will (eventually) publish most of the material submitted by readers.

Commodore Defended

IN REFERENCE to Peter Sandys' column on the Commodore PET in the February issue of *Your Computer*, I feel the PET was badly done by.

His first major criticism was of the differences in ROM. However, all versions of the PET/CBM (from the 4016 to the 96K SuperPet) are now being sold with all but one ROM chip identical, while the odd ROM out is referenced through a jump table, so most software is compatible.

Also, the CBM 4016, the smallest of the range, can be easily expanded to the highest of the range (the SuperPet) for under $1000.

Other features of the system that make it a sellable system in the 80s are: rock steady software-programmable VDU; advanced screen editor in ROM; and powerful disk BASIC in ROM.

Commodore peripherals add incredible

your computer text file

power to the system, since all peripherals are intelligent. For example, the disk drives contain two processors (one a 6502), 4K of RAM, 8K of ROM, a 6522 I/O chip, and these are accessible through BASIC programming, giving a dual processor system.

This may sound like a bit of a sales talk, but after the knock the machine received in your so-called Commodore column, I feel it needed to be said.

Oh yes, thanks for the great article and supplement on the Bee...a good show for Australia.

G WILKINS
Macquarie, ACT

Microbee Neglected?

PERSONALLY I am dismayed about the non-comment on the Microbee. One month you donate your cover, three pages and an insert to it; the next month nothing!

Here we have the great new force in Oz computing, mega-cheap, maxi-expandable, et cetera, et cetera, yet you don't even run a full review!

I was going to buy one, but I have no comments beside the manufacturer's to judge the machine by. How about a comprehensive review about the thing, both construction-wise and during usage phase (Alexander Haig where are you?)?

IAN BARNES
Macquarie, ACT

Al Haig has jet-lag!

Sorcerer Tidbits

FIRST, I want you to know I'm an avid reader of *Your Computer*, having followed it since the first issue. I wish you every strength for continuing the good work.

I'm writing to offer a small tidbit for the benefit of Sorcerer users who are programming in Micropolis BASIC. Most of my offerings go to SCUA, but as I've sent a bundle of stuff to them, I decided to see if you are interested.

Sometimes it is desirable to halt a program until the operator has done something. For example, the operator may be required to switch on the printer or read through the display before the program continues. This can be achieved by using INPUT with an instruction to press RETURN when ready.

Obviously the variable associated with such an input is just a dummy and only used to prevent a syntax error.

The tidy aspect of this technique is the question mark that is automatically displayed after the INPUT prompt. The code for this character can be found at address 1950H. The code for the space following the question mark is at address 1955H so armed with this knowledge you can include a POKE or two in the program to tidy things up.

A simple way is to replace the space with a backspace and delete combination (ie POKE(6485)=8), which effectively removes the question mark and space, leaving the cursor positioned directly after the last character of the prompt.

By experimenting you'll discover other approaches and after using INPUT in this way a POKE or two is all you'll need to restore the status quo. If both addresses have been modified do the following: POKE(6480)=63;POKE(6485)=32.

That's it — I know it's simple, but it's good to have such things up your sleeve for neat and versatile programming.

PHIL CHARLEY
Wickham, WA

Funny You Should Mention...

NICE to see OSI getting a look-in along with the other popular systems such as PET, SORCERER, TRS-80 and ZX80. But you've missed one which has more ads in America's respected Byte magazine than any of these.

I recently spent an enjoyable evening counting hardware and software for various micros in two recent editions of Byte. The results were:

Systems	Ads
Apple	100
Atari	60
Tandy	33
Commodore	25
Sorcerer, ZX80, OSI	16

(Not including S-100 systems, which encompass many manufacturers.)

Are all of these micros honoured by having their own section in your magazine? The astute among you may notice that all but one have been so blessed.

The Atari computer, which ranked second only to the living legend (the Apple), missed out. As an Atari 800 owner, I am not very happy with this injustice!

Perhaps, you might think, the Atari does not deserve to be present in a computer magazine, after all...isn't it only just a jazzed up old television game? Wash your mind out with soap! The Atari has the best features of most every computer listed above.

So how about it...let's hear more on the Atari and perhaps it may get the ultimate recognition — a section in *Your Computer*.

A user group for the Atari would be nice, too. There is a lot more in this computer yet to be uncovered and a user group is a good way to organise the explanation!

ROGER ONSLOW
Millfield, NSW

Strange you should mention the Atari; and just as strange that we should hold on to this letter until after we'd published our first Atari column...

We must take issue with your justification, however — we have only 20 or so American readers (in the US, at least), so their buying habits don't really count.

The Sinclair Saga

JOHN BATTY in his column Your ZX80 Computer says a ZX Microfair event took place in London in 1981, and briefly mentioned the peripherals which are available for ZX machines.

I trust there would be others who would like a great deal more information regarding exactly what is available and from where.

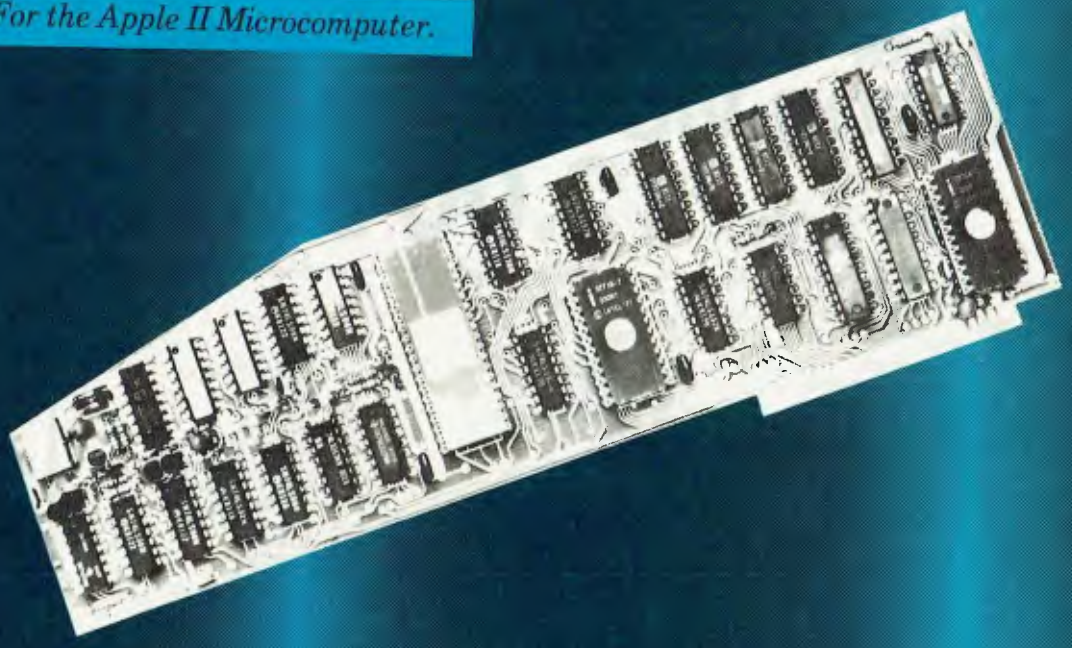
Incidentally, the Sinclair company doesn't seem very enthusiastic towards selling its product direct to overseas (Australian) customers. Instead it refers clients to Sinclair Australia. This isn't something to become ecstatic about because the difference in price is quite significant.

An additional point is that with the release of the inexpensive Commodore VIC 20, Sinclair Australia will have to reduce its prices if it wishes to gain further customers.

DON DE IESO
St Peters, SA

VISION-80

For the Apple II Microcomputer.



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005	RAINBOW	105	PINBALL	407	VICHECK
006	CRAZY BALLOON	106	SKIER	408	SPACE DIVISION
007	MOLE ATTACK	107	SIMPLE SIMON	409	LONG DIVISION
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017	VIC CUBE	205	BOUNCE OUT	502	DUNE BUGGY
018	MONSTER CHASE	206	MONSTER MAZE	503	SKI-RUN
019	LASER FIGHT	207	HOME INVENTORY	504	THE WORM
020	EUREKA STOCKADE	208	MATHS HURDLER	505	SUPER WORM
021	LUNAR LANDER	209	LOAN ANALYSER	506	COSMIC BATTLES
022	ROCKET COMMAND	210	CODE MAKER	507	SPACE DEFENSE
023	CITY BOMBER	211	CODE BREAKER	508	FROGGER
024	MINEFIELD	212	CAR COSTS	509	CAR RACE
025	HANGMAN	301	METEORS	601	A-MAZ-ING (6K)
026	PACKMAN	302	DEPTH CHARGE	602	AMOK
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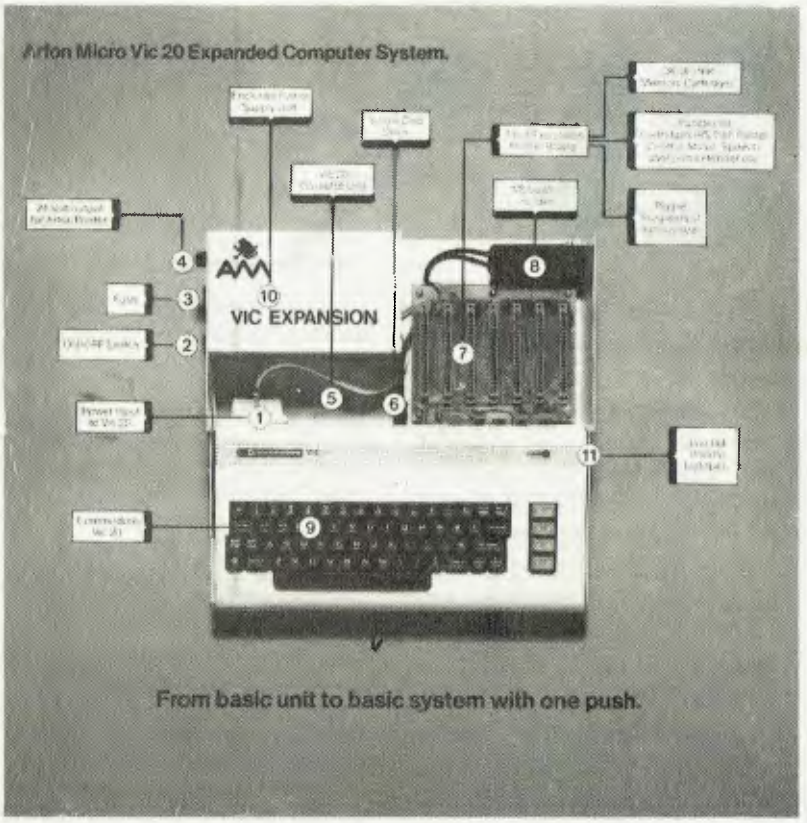

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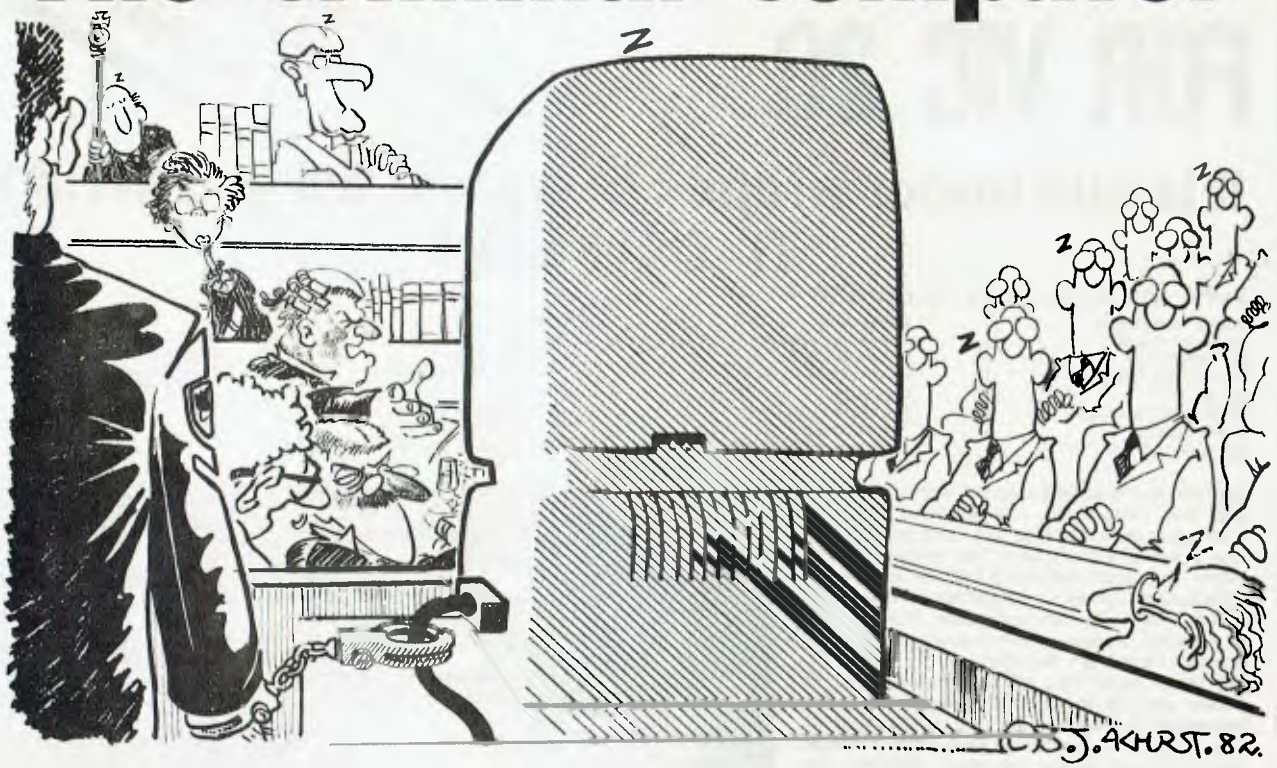

Have you seen any newspaper headlines recently suggesting Computer Crime is on the increase? Chances are you have. Well, regular columnist FRANK LINTON-SIMPKINS has taken an interest in the subject of computer crime and crimes against computers from the beginning, yet going in to his 27th year in and around the computer industry, he only recalled three Australian examples to relate to us.

Of course in usual Linton-Simpkins style, the three local cases and the better overseas examples are worth reading; especially the one about the late-night philosophical discussions on the control console...

IN OUR nation, divided since 1975 into two armed camps there is only one thing in which all classes and sexes are united. It is a fear which stops just short of the pathological of computers and all their works and pomps.

This phobia is matched in intensity only by the fear, again crossing all lines of distinction, of the priestly classes which control the computers, seemingly in defiance of the writ of God and man.

One manifestation of this fear of the darkness beyond the light around the coffee machines is the announcement which appears periodically in the press that some member of the police force, an auditor or salesman for computer security systems has said something called Computer Crime is rampant and is costing the Australian community "X" hundreds of millions of dollars per year.

The size of "X" varies with the imagination and audacity of the speaker, but all qualify their dire warnings by saying the true figure will never be known. One curious point is the magnitude of "X" is lowest if a policeman is speaking and highest if the salesman for security systems is issuing the Cassandra-like alarm.

No evidence of exactly where and how the computers and their servants are performing all the rip-offs is ever offered by the speakers. But much detail is always available on how the rip-offs can be controlled, if only the computer owner will install certain programs, pay for more police with his taxes, install certain "equipments" (compu-speak will pay, one day), or retain the services of certain computer sleuthing companies to track down evil doers, mechanical or biological. This will only cost about the price of two white Volvos — a sales manager's ransom that is.

Recently, the old computer crime thing has begun to wear a mite thin in the absence of local evidence, so the smart money is betting the compound term Computer and White Collar Crime will become the preferred title in future. One notices the brand new Police Commissioner in and for NSW uses it already.

White Collars — Never

Mind you, that compound term is fairly misleading. You would have some difficulty finding a white collar within half a kilometre of most computer installations. In general, computer people are a scruffy lot. In the years I spent around the wretched things I can recall having seen not more than two white collars and neither of them on me. But then again, I wasn't ever located at an IBM installation.

Since writing my first computer program in 1956, a mere 136 years after Lord Byron's daughter Ada Countess Lovelace wrote the first recorded computer program, I haven't seen too much computer crime, except perhaps the cost of some software, and also equipment service charges.

What crime involving computers has been seen in Australia over the last quarter century almost always involves a permutation of fraud. Some of these frauds have been dull and colourless, and the others have been dead boring. Like much of the use of computers in Australia our frauds show a certain lack of imagination and a complete lack of style.

All this means it is far more interesting to look at crimes against the persons of computers or those few crimes which depend on the attributes of a computer for their existence.

The Computer A Dupe?

In most fraud cases both here and in the computer and organised crime Mecca, America, the computer is usually an innocent dupe and about as guilty as a filing cabinet woud be in the perpetration of a mining company fraud — sometimes called a flotation or going public.

Some of these crimes against computers were committed in the names of varying causes. One was in what appears to be a temporary or permanent state of insanity, probably caused by the perpetrator having lived far too long in the southern states of America.

Despite the pitiful victims of these crimes and the harm done to innocent computers, it is hard to see where any real sympathy will come from. The managements of this country will rejoice that the machines which pose a potential threat to them are being made to suffer for their presumption, while the lower orders simply and correctly see computers as present rivals which will inevitably take away lower order jobs.

Besides, managers will think if there are no computers then there will be no computer people to demand pay rates outside the normal remuneration structure of the company,thus upsetting the good men who lack only the brains and the imagination to rival the computer men. One recalls Parkinson: "He's brilliant alright, but is he sound?"

The First Stroke

The first Australian attack on the life of a computer was not, however, made by disgruntled management people, but by the famous "person or persons unknown."

It was a long time ago, when Vietnam was not a place which emitted boat people, rather a nation where we sent our young men who would go willingly and imprisoned others, who had the belief and the courage to deny the right of a government to send them to die for a cause that was uniquely American.

During the resistance movement in the Vietnam war period things became rather heated in Melbourne, just like they used to do on St Patricks Day marches in the 1930s. It came to pass that one night a person or persons unknown girded up his or their loins, loaded the ancestral 12 bore shotgun and taking careful aim through one of the windows of a Computer Service Bureau in Melbourne, let off both barrels. The target was a small and relatively harmless computer.

Shortly after the shooting, the manufacturer of the computer was able to announce that its condition was serious but stable, and that it would live. This speaks volumes of the strength built into computers in the sixties, or alternatively, tells us the person and his friends, the persons unknown were awful marksmen.

Then shortly afterwards another, or perhaps the same, person or persons unknown dropped off a Molotov Cocktail on another computer causing it to overheat rather drastically. The reason for the savage and unprecedented attack on the computers was the parent company of their owner was involved in the manufacture of napalm which was being used in Vietnam. But neither the person nor persons unknown has ever been charged or even interviewed by the police unit in Victoria which has to combat computer and white collar crime.

Heinous Activities

It's all rather sad really as another computer which was owned by a company involved in far more heinous activities in Vietnam went unmolested. This second company was involved with the design and the supply of equipment which was used in a devilish way.

Tens of thousands of sensing devices were dropped into the jungles. They were equipped with radios, so their location could be plotted by using direction finding techniques. The sensors detected movement or sound, and relayed this information to a computer centre in Thailand. In turn, this centre directed B52 bombers to the site of the detected movement and automatically dropped bombs on the detected targets.

If the sounds had been made by Viet Cong units well and good. But the sensors would also pick up the sounds of courting couples, herds of pigs or a person disappearing into the scrub in lieu of a loo. It all seems a mite indiscrimate — computer crime would seem ot have many faces.

Returning to criminal attacks on computers' persons we move to a smallish town in a state in the US south. (In my January column I may have said east).

A man rocked up to an automated teller machine in town that's almost a clone of Birmingham and inserted into the machine's frontal orifice a note demanding money. The menaces which are normally associated with this sort of action being provided by that vital part of the American national dress, the 38 revolver. In this case one believes it was a nice touch of totally un-American irony here a Police Positive.

Courageous to the last, the automated teller machine not only refused to hand over any cash, it resolutely refused to acknowledge the robber's existence. And it was probably this disdain which upset the man more than the refusal to issue any money.

Muttering something in the normally unintelligible way of Americans outside major cities, he gave the thing a few shots in the brisket. It died satisfactorily and the man was left standing there with a smoking gun and no money.

He was still there when a large policeman who had witnessed the whole thing from across the street ran over and accidentally fell on him in the time honoured way of arrest practised by rural and urban police forces since they came into being. Shortly after that, well probably about 56 hours after, police reported a man was assisting them with their inquiries in the cellar of the police station.

There was some move among bank officers in Australia to have a medal struck for the man in the cellar under the policemen, for his services to bank officers. Nothing came of this, or the alternate plan to spoon chocolate gelato into the frontal orifices of Australian automated teller machines. (Why chocolate and not tangerine gelato? There's more people who like chocolate than like tangerine).

Certain Familiarity

It was sad and pitiful, but even the Australian crimes against computers have a certain familiarity about them: they are only variants of more ancient crimes. Shooting things has a long history, arson as long. Even fraud is at least 2000 years old.

The oldest record of fraud is in the new Testament parable of the wise servant. This servant was going to be sacked, so in order that he might be looked after by his master's debtors after the firing, he defrauded the master of goods and money owed. He did this by either forgiving the debtors or heavily writing down their debts.

It showed a certain lack of knowledge of human nature by the servant. The previous debtors simply didn't want to know him after the sack.

Now let us look away from crimes against computers and archaic frauds to crimes which rely wholly or partly on the attributes of computers. There are only three I can be certain of in the last 25 years and as crimes they're fairly diverse.

One involved indecent exposure and scandalous public behaviour, one the theft of time and the other one putting the snatch on some vital programs stored on tapes. Two resulted in punishment, one by the law the other by martial agony. The third resulted in the felon starting a very good business, because his employers decided not to prosecute. In fact what he did may not at the time have been covered by the law, and it may not be yet.

But before we begin, you might ask is it true that I have only heard of three uniquely computer crimes in 25 years? Ah then, you might go on, how many haven't been discovered? What do you want from my life? How many murders are committed each year and aren't discovered, how many rapes, how many company frauds? Piffle, I stick to my three and you can find your own.

First, let us look in on the indecent exposure. First things first I always say.

Back in the days when if your firm owned a computer you put it in a glass box, so the public and the gentry could gawk at it as you passed, there was a computer located facing a Sydney city street. Each night the late shift programmers et al used to pull the curtains across so foot passengers on the footpath outside couldn't see them take their shoes and whatever off.

Indecently Exposed

The curtains were under tension, so if the cords were not tied then there was an unwanted gap of about 15cm (six inches) between the two central ones.There was in that installation at that time a lady much interested in promoting her own career. To do this she often engaged in philosophical discussions with a fairly senior mangement type late into the third shift at night.

One night as they, in their philosophical discussions, were entertaining a fallacy, the curtains opened under tension.

The gathering crowds alerted the management type's wife that something was going on in the computer room. And indeed things were going on — across the control console, to the muffled cheers of crowd. The computer was going crazy too.

The career lady was made to find another (career, that is) one and the man never was let out alone again. Meantime, one police man who witnessed both the action when the curtains sprang open and the action when the wife arrived and invaded the computer room was too helpless with laughter to lay any charges. This crime couldn't have happened without that computer console...

One other delightful computer crime which happened in Sydney took place at a large insurance company's computer centre.The midnight to dawn operator at the centre used to spend his days selling computer service bureau jobs, which he would run at night on his company's computer.

In the course of several years at this game he became to suffer from sleep deprivation. Thus, one morning, the early shift arrived to find him asleep at the console with all his service bureau jobs spread out around him. This vision splendid resulted in his employers firing him — that is, the company let him resign.

No action was taken to contact the police: it would have been too, too, embarrassing if the truth had ever got out. But for years he was known among the initiates as Procrastination. He now runs a rather wealthy little consultancy.

The final crime uniquely possible in the computer age is one which took place in Europe. A man and his small truck pulled up at a computer centre owned by the giant ICI company and carried away a few reels of magnetic tape and sundries. These represented the financial programs for the company for Europe and were beyond price.

However, the man set a price and agreed to make the transfer in Oxford Street, London. But when he made the pick-up the street was swarming with the Sweeney. The real Sweeney are just as violent and much bigger and nastier than television's Regan and Ca'ah; a disgruntled systems analyst was easy game and they SWOSed him firmly.

Crime never pays in the end, does it? I mean Al Capone's estate was under $US100,000,000. □

There is a curious, almost criminal, habit in the computer community of taking good English words and altering their meaning, just like the legal profession has done. Our computer people have fallen under the thrall of those semantic pirates the Americans. Not content with altering the meanings, these assassins of Fowler have gone further than any football commentator.

Take the word equipment. Custom would teach that equipment is both singular and plural. But no, the computer people have counterfeited the ugly word "equipments" into our suffering language. This may be one more example of unreported computer crime.

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. . . And Now, Police Computers

Yes, Sydney Has A Traffic Control System

By Frank Linton-Simpkins

IN THE early days of the colony of New South Wales, traffic wasn't a problem. And even if two horse-drawn carts came into contact while moving, they might have a speed of closure of less than 20 km/h.

The layout of Sydney streets was determined by the need to make the lives of horses easier, and the determination by the British government that the lives of the resident humans should be as unpleasant as possible.

Thus few of the city streets meet at right-angles, the city blocks vary in length in a random way and the grades are odd to say the least.

All this has resulted in a city whose traffic patterns resemble some traffic engineer's version of delirium tremens. Traffic flows are, in short, irrational, and subject only to the mathematics of catastrophe theory or the rules of some game of chance.

So when it was announced that a system of automatic traffic lights with central control was to be established for Sydney, many of us thought the government, in the way of governments all through history, was raving mad. And as for the poor engineers and data processing people who drew the short straws, they might as well go out and step off the then highest point in Sydney, the bridge pylon, before things became too much for them.

But to the amazement of all, the designers and IBM actually succeeded in getting a system working and working better than anyone had any right to expect or hope. The system was programmed by a series of plug boards which could be changed to meet the changing traffic requirements.

Many people may have no idea of what a plug board is, and they don't know how happy they are!

It was something like a massive old-fashioned telephone exchange, where the operators physically connected lines from one subscriber to another by pulling and inserting plugs. The DP sort of plug board was one which resembled the face of the switchboard, but it had a removable face so set patterns of connections could be easily set up.

An Agony Of Metal

A big plug board was a terribly involved thing with wires twisting across it in apparent metal agony. The wires plus the removable frame weighed as much as 30 kilograms, requiring rather fit operators.

The program sequence had to be able to determine or at least form an estimate of how the traffic was moving around the city. One way to do this would have been to have a patrol policeman everywhere radioing in flow patterns, or some remote traffic counting and reporting system.

However, the method chosen to provide operators with traffic flow information was simply to mount remotely-steerable television cameras on tops of strategically sited city buildings.

These cameras are still there for all to see, though they're not nearly as important an aid today as they were in pre-computer plugboard days. But the wall full of monitor screens at the traffic control centre near police head-quarters is still striking.

The cameras are very efficient. It is certainly possible for operators in the centre (mainly police officers on my last visit) to identify people on the footpaths or crossing the roads. In certain areas the operators can read the headlines of newspapers held by pedestrians.

That's how it was done in the pre-computer era, with a combination of DP equipment, closed circuit television, and the experience and training of traffic police officers and Department of Main Roads people. But there had to be limits on the area covered by the system. The television camera set-ups cost heaps and the initial plug boards were limited in the complexity of the program they could handle.

Only a limited area of the city could be handled and the traffic flows outside that area couldn't be studied at all. Therefore the system in the city could only respond to situations which had already developed, rather than anticipate heavier or lighter traffic densities from data sent in from remote areas.

At the time of the plug-boards, computers which could have easily handled the computation and storage loads of the system were certainly available, and there was some communication gear about which could have provided remote data. However, all this gear would have priced the system out of existence.

A Mini's Timely Emergence

Luckily, the development of the next stage almost directly coincided with the emergence of the advanced minicomputer which didn't cost too much for the usual limited budget.

The problems of the inner city area had largely been solved by empirical methods and observation, so the switch to computer operation wasn't as traumatic as one might have imagined. A properly specified system isn't all that hard to implement — it's the ones with large 'don't know' areas that screw things up for everyone.

The mini was a Digital Equipment model, and DEC seems to have held the account without too much difficulty ever since. With the introduction of the minicomputer system to replace the plugboard monster, the character of the system changed mightily. Then came the concept of minis controlling arterial routes into Sydney, feeding traffic flow data to the main computer site, where it was handled by a larger central mini.

Lights Controlled, Not Drivers

If you look at Sydney it has a multiplicity of tangled streets running everywhere, but only a limited number of main arterial roads entering the city.

There are only five main entry routes to the city and it's possible to have these computer controlled. That is, the traffic lights are controlled, even if the drivers remain, as ever, barely in control of themselves.

At each intersection controlled by lights there is a silvery box about 1.4 metres high. It contains a Phillips micro-controlled system which runs that particular intersection and adjusts its light timing under the overall strategic control of the central site computer, via the dedicated route computer.

The intersection computers are provided with local traffic information from large capacitance loops set into the road bases on the intersecting roads. This information is transmitted to the route computers. After some reduction it is sent on to the central site computer.

All this has largely made the television camera system obsolete. Many operators at the central control centre rarely look at it.

The route computers are situated alongside the main roads they control. They are located in concrete blockhouses and operate without any human monitors on site.

The blockhouses are rather pleasing in shape, having fluted concrete surfaces. Rather naturally, the Police traffic people and the Department of Main Roads are hesitant to identify the locations of these blockhouses, but they can be seen by alert people within five kilometres of the northern side of the Harbour Bridge, for example. □

HEARD ON THE BUS

By LEON YENDOR

AS MUCH as I like computers, I have no illusions about their ability to solve problems. That is not to say they don't, it is just that most people think of the wrong kind of problem for computer solution.

Look at it this way: if a business has a need for a computer, buying one with the appropriate software will solve some of its problems — but it is not the computer which solves them, it is the use of the computer. When a scientist uses a computer to derive an answer to one of his questions, *he* solves the problem. The computer merely carries out, albeit rapidly, a lot of tedious calculating and sorting. The algorithm is the key and it is of human creation.

Let us look, then, at algorithms to try to see what we are doing in our programs and whether we can do better.

If I was to pose a quiz question for solution and ask for a program to run on a computer, the average person with computer skills would often suggest a method to arrive at the answer an algorithm which he would avoid if asked to manually calculate the same task. Here is a case...

The Wimbledon Tennis Championship is a large knockout competition in which the organisers must wait for the entries to close before knowing how many matches they must schedule. In each round the players will be paired (ignore seeding as it doesnt affect the maths). If there is an odd number at that round one lucky player will have a bye. The paired players play one match and the loser is eliminated, thus (roughly) halving the remaining players by each round.

Given as input (a variable) the number of entrants, write a program to show the number of matches required to find the champion.

The usual method suggested is:

1. Let X = number of entrants.
2. Let A = the integer portion of X divided by 2.
3. A will be the number of matches in this round.
4. If twice A does not equal X there is a bye.
5. The number of players left equals A (plus one if a bye).
6. Let X = number of remaining players.

7. If X = 1 then we have a winner and are done.
8. Otherwise go back to step 2 and keep coming through.

Of course we keep adding the value calculated in 3 to a running total.

If the entry list was unreasonably large this becomes too tedious for mental arithmetic; so why let a computer do it this way either? Just because you are still amazed at how fast the thing goes does not mean you can justify inefficient algorithms.

I'm sure you would not have to do this program too many times before you noticed the answer is always one less match is needed than the number of entrants.

If you only found that out by doing the problem the hard way a number of times, then I'm disappointed in you anyway. Surely it is obvious that players are only eliminated by being beaten, that the champion is unbeaten and each match played produces exactly one loser.

Inspection And Correlation

That isn't the point, however. Even if you missed the inspection method you would have noticed the correlation eventually (wouldn't you?). The computer programmed as above never will. All it would do is do your hack work — if you didnt inspect a run of many inputs you might never see it either.

So whence computer solutions? If you can achieve results in this area it may be youll become an important pioneer in artificial intelligence.

All of the above was really aimed at leading you to an interest in designing better solutions to your problems. Whether you are writing a program or using one written by someone else, the important thing is the algorithm on which it is based. A poor choice can give apparently correct answers while being dangerously faulty with other input.

And if this article does stimulate you to further consideration of algorithms and their use, you could do much worse than to study Donald Knuths work *The Art of Computer Programming*. Although these volumes are about non-numerical algorithms, there is no better approach to the concepts of computer solutions and a disciplined path for thinking them out.

At about $16 in paperback and $29 in hard-cover for each volume, these seven books may seem expensive but reading almost any serious article on programming will show techniques gleaned from them. It is not uncommon for those who really know their subject to credit Knuth in the references and bibliographies appended to their articles.

Its Not Heavy Going

For readers who are scared off by the idea that this means the subject matter is too heavy, I should add that the text is as readable as it could be and there are directions for skipping the deeper sections needed only by specialists. The exercises at the end of each chapter are graded and coded with the degree of mathematical competence required for their solution.

In short, Knuth presents a subject which could easily be used as a non-addictive soporific in a much less boring way than most! I wont guarantee youll find these books un-put-down-able, but you won't find any more easily read references on the subjects covered.

The books are not always easy to find. I bought my copies at DP Education, of Chatswood, NSW. This store will order them for you if they are not in stock.

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PART IV

By popular demand, LES BELL this month diverges slightly to cover programming I/O ports and, in particular, to write a program to allow a computer to communicate with an acoustic coupler.

your computer tutorial

A NUMBER of people have asked me how they would write a program to enable their computer to talk to the Mi-Computer Club Bulletin Board.

Okay, you win... this month I'll set aside my carefully-planned exposition and deal with input/output, with particular reference to serial I/O ports.

As usual, the program will be written to run under CP/M, and assembled using the CP/M assembler. However, exactly the same principles apply to any computer, and where CP/M operating system functions have been used for console I/O, these can usually be replaced with calls to the monitor program of your computer.

And, Or, Um, Not...

Before getting into the program proper, we should spend a little time on formal logic, the only common interest of philosophers and electronic engineers. Here's a simple example:

IF it is a nice day AND I have $5 THEN I will go to the zoo.

There are three simple statements in the above sentence, each of which can be true or false (T or F):

Statement 1: It is a nice day
Statement 2: I have $5
Statement 3: I will go to the zoo

By linking them together with IF, AND and THEN, we are making the truth or falsehood of the third statement depend upon the first two. Both statements 1 and 2 must be true in order for statement 3 to be made true as a result. If statement 1 is false (it's raining) then statement three is false (I won't go to the zoo).

We can tabulate the possibilities (nice/rainy day, have/haven't $5, go/not go) in a **truth table**:

Stat. 1	Stat. 2	Stat. 3
F	F	F
F	T	F
T	F	F
T	T	T

Fig. 1. Truth table for AND function.

Similarly, in a computer, the Ts and Fs can be replaced by 1s and 0s, so the truth table looks like this:

X	Y	Z
0	0	0
0	1	0
1	0	0
1	1	1

This could be stated: If both X and Y are 1, then Z is 1.

Supposing our logical statement said:

IF I have $5 OR I can borrow $5 THEN I will go to the zoo.
then our three simple statements are

Statement 1. I have $5
Statement 2. I can borrow $5
Statement 3. I will go to the zoo

and they are related by IF, OR and THEN. The truth table looks like this:

Stat. 1	Stat. 2	Stat. 3
F	F	F
F	T	T
T	F	T
T	T	T

Fig. 2. Truth table for OR function

In a computer, the truth table would be most simply represented:

X	Y	Z
0	0	0
0	1	1
1	0	1
1	1	1

This can be stated: if either X OR Y is 1, then Z is 1.

There are a couple of other useful logical operators: NOT and XOR (exclusive-OR). The truth table for NOT is

X	Z
0	1
1	0

In other words, Z is NOT X; Z is the inverse of X.

Exclusive OR is related to OR; here's the truth table:

X	Y	Z
0	0	0
0	1	1
1	0	1
1	1	0

In other words, If either X OR Y (but not both) is 1, then Z is 1. This is most useful as a test for equality; if X and Y are the same, then Z is 0. Another use of XOR is as a selective inverter; you'll notice that if X is 0, then Z = Y, but if X is 1, then Z = NOT Y. Finally, later we'll see that XOR is very useful in encrypting data to make it unreadable and hence secure. Now on to I/O.

Input/output Ports

What is an I/O port? Basically, it's an electrical connection (or interface) through which the computer can communicate with the outside world.

Interfaces come in two flavours; parallel and serial. Inside the computer, information is transferred between processor and memory in parallel; that is, on eight parallel wires. A parallel interface really just connects that data to an outside peripheral.

A serial interface is a bit more complex. In this case, a special integrated circuit is normally used, known as a UART (Universal Asynchronous Receiver/transmitter) or ACIA (Asynchronous Communications Interface Adapter) or similar.

This chip has two separate functions. It

takes serial data in from the outside world, and converts it to parallel to be placed on the parallel data bus of the computer, and it performs the reverse function for transmitted data.

Let's look at how it does this. Serial data consists of a stream of ones and zeros; to make it easy to decode the information, each character is preceded by a start bit and followed by one, one-and-a-half or two stop bits. To assist with error detection, a seven-bit character sometimes has an eighth parity bit added.

The internal circuitry of the UART generally takes care of all these functions automatically. When you send a character (or byte) to the UART, it will automatically add the start, stop and (if required) parity bits. Similarly, on receiving a character, it strips out the start and stop bits, and checks the parity to see if an error has occurred.

Sometimes the UART can get confused about the start and stop bits, and lose track of how many bits of a character it is supposed to have received; this is called a *framing error*, and the UART will have a status bit to indicate this.

Similarly, if the UART receives a character, and you don't read it quickly enough, the next character to be received will over-write it; this causes the UART to signal an *over-run error*.

Generally speaking, the UART is connected to the data bus of your computer via one or more I/O ports. It has several registers, of which the minimum set are the transmit data register, the receive data register and the status register.

To send a character, you check the status register to see if the transmit data register has been emptied; in other words, to see if the UART is ready to accept a character.

While the UART is sending a character, it will show this on a flag in the status register until the transmission is completed, when the flag will change, and a new character can be accepted.

To receive a character, you again check the status register to see if a character has come in. If it has, you read the receive data register, and this has the side-effect of clearing the data-available flag ready for the next character to arrive.

The registers are accessed via the 8080 IN and OUT instructions. If this all sounds terribly complicated, rest assured, it's not that bad in practice!

A Practical Example

Having discussed in general terms how a UART works, let's go on and write a communications program for an actual serial interface.

In this case, it is the Godbout/ compupro System Support 1 board which carries, amongst other things, a full serial port. But remember the same techniques, and an almost identical program, can be applied to any computer.

The UART chip used on this board is the Signetics 2651 (also second-sourced by National Semiconductor). This is about the most complex and powerful UART chip around, and has more than the average number of registers.

There are the two data registers for transmit and receive, which are simply written to and read from. There's also the status register mentioned, which indicates the various conditions of operation of the circuit. Rather than list all the status bits, I'll confine our discussion to the bits needed, and ignore the unecessary ones.

Status bit 0 (the least significant bit) when high indicates the UART is ready to accept a character; when low it indicates the UART is busy. This is normally abbreviated TXRDY.

Status bit 1 is RXRDY and there are no prizes for guessing that when high it indicates that a character has been received and is ready to be read from the receive data register.

The remaining bits indicate the various error conditions as well as the state of the Carrier Detect and Data Set Ready lines of the RS-232C serial interface. These do not concern us; interested readers should obtain the 2651 data sheet.

There are three more registers, all of which can be read or written. Two of them, the mode registers, occupy just one I/O port address. This is accomplished by internal logic that allows the user to write the first mode register and then the second. Therefore it is important to write or read both registers, and to consistently deal with Mode Register 1 first.

I shan't explain here the detailed operation of the mode registers and command register; but briefly, the mode registers allow the character length, parity, number of stop bits and baud rate (transmission speed) to be set up, while the command register allows control of the RS-232C handshaking lines. These registers normally only have to be set up once, at the beginning of the program; a process that is called initialisation.

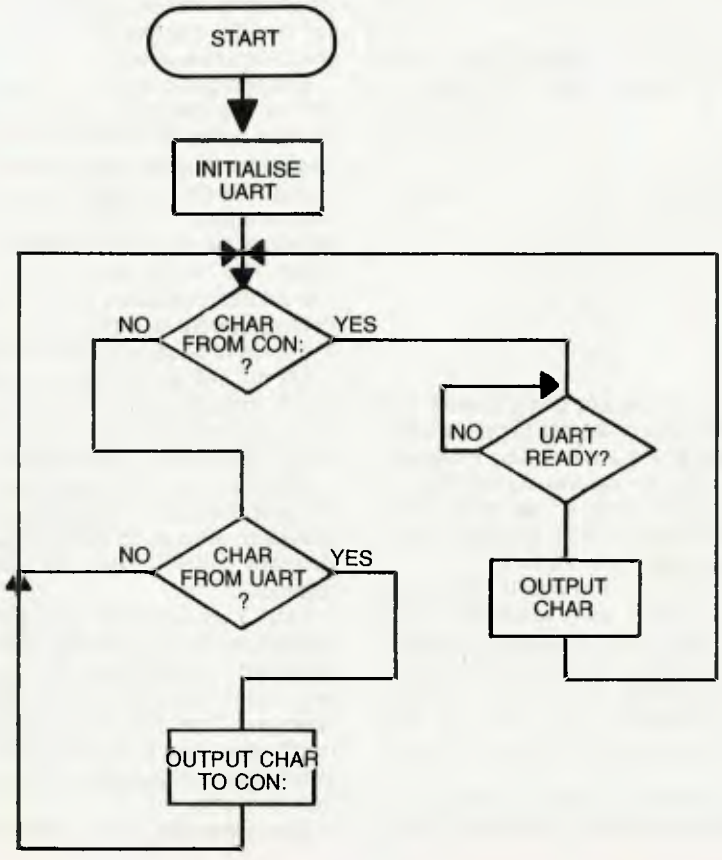
With this information, we are now set to write a simple program to make a computer emulate a dumb terminal in order to communicate with a time-share system or bulletin board. We'll start by writing simple routines to input and output a character.

Here's a routine to input a character:

```
rbf     equ   00000010b ;receive buffer full mask

gchar:  in    status    ;check receive status
        ani   rbf       ;received a char?
        jz    gchar     ;no, then wait for it
        in    data      ;then get it
        ret             ;and return
```

How does this work? The first line of code inputs the status byte to the accumu-



lator. That's fairly straightforward. Now look at the second line. We said above that the receive buffer full flag is bit one of the status byte. In other words if the input status word is

00000010

then a character has been received, while if it is

00000000

there is no character available. That is fine, except that all the other bits of the word can be arbitrarily 1s and 0s, so we have to ignore them. We do this using the ANI (and immediate) instruction. This simply ANDs every bit of the byte following the instruction with the corresponding bit of the accumulator.

If we set up rbf to be 00000010, then the bit we are interested in will remain unchanged, while the others will all be set to 0. Remember, from the discussion above, that X and 0 = 0, while X and 1 = X. Therefore, after the ANI RBF instruction, the accumulator will contain either 00000010 (if a character has been received) or 00000000 (if one has not).

The next step is to jump back and check the status again if the accumulator is zero. Thus, until a character is received, the computer will just loop round and round this bit of code, doing nothing else. On the other hand, if the accumulator contains 00000010, it will not jump, but continue on to input the character.

Simple, isn't it? Transmitting a character is just as easy; here's the code:

```
tbe   equ   00000001b   ;transmit buffer empty flag

      mov   b,a         ;save char in B register
tit:  in    status      ;check status
      ani   tbe         ;transmitter ready?
      jz    tit         ;no, then wait
      mov   a,c         ;get char back
      out   data        ;and output it
      ret
```

In this case, we are going to enter the routine with the character to be transmitted already in the accumulator. However, we are going to use the accumulator to test the status byte, so we temporarily store the character in B, and get it back when we are ready to output it.

If you don't want to use B because it already contains some data from your program, then you can replace the MOV instructions with PUSH PSW and POP PSW respectively, to save the accumulator on the stack. Apart from that, this routine is almost identical to the read routine.

These are the standard routines you would use in a program when you simply want to wait for a character to be input, or output a character with no time restraint. However, our terminal emulator must be able to transmit and receive at virtually the same time. In other words, if a character hasn't arrived, it mustn't wait for one, but check to see if a character is ready to be output. Thus these routines won't work in this application - they need slight modification.

A Terminal Emulator

This terminal emulator must check to see if a character has been input from the computer console keyboard, and send it, if one has. It must also check to see if a character has been received from the modem, and send it to the console if one has.

Input/output under CP/M is done by loading the C register with a function number and then calling location 0005 in memory. In this case, the direct console I/O function is used (function number 6). Here, if E contains FFH, then the function either inputs a character and returns it in A or returns 0 in A if a character was not ready, while if E contains anything else, the character in E is output to the console.

In other systems, such as the TRS-80, MicroBee et al, it is more common to directly call a subroutine in read-only memory (ROM). If your machine has such routines you can ignore the **mvi c,dcio** statements and simply move the character into the appropriate register and call the subroutine directly.

Enough gas-bagging, already! Listing 1 shows the complete program. The first section contains comments and the various equate statements. Notice that although the data registers are at 5CH, the status register is at 5DH and so on, all the registers are specified relative to a single base. This means that should I ever set the address switches on the board to a different address, I only have to change the value of base, and not the rest.

My m1, m2 and c1 are the initialisation words that are written into the mode and command registers of the 2651 integrated circuit by the initialisation routine.

The init routine will probably be different for your computer, if it is needed at all. A previous version of this program, for a different UART, had no initialisation routine.

Four lines after the label *loop:* is the instruction ORA A. You may be wondering what that is doing there; all it does is OR the accumulator with itself, which won't change it. True, it leaves the accumulator unchanged, but it has the side effect of setting the flags according to the accumulator contents.

The preceding call to the BDOS will return zero if no character was available from the console. What we don't know is whether the BDOS's method of putting zero into A will also have set the zero flag.

For example, the instruction MVI A,0 will put zero into A, but does *not* set the zero flag. On the other hand, the instruction XRA A clears the accumulator to zero, and does set the flags. By using the ORA A instruction, the flags are set appropriately for the conditional jump instruction which follows.

We must have some means of exiting the program, so if a character was input, we check to see if it is a control-C. If it is, then we jump back to CP/M (or monitor program).

Apart from these features, the program is fairly straightforward, and corresponds closely to the flowchart. Next month we'll look at block fills (clear screen), block moves and other useful routines. □

```
;       terminal emulator program
;       Written 1 [illegible] by Les Bell
;       Modified 5/2s/82 to drive Goddess 85A board
;
base    equ     50h
data    equ     base+0ch        ;2651 data register
status  equ     base+0dh        ;2651 status register
mode    equ     base+0eh        ;2651 mode register
cmnd    equ     base+0fh        ;2651 command register
;
tbe     equ     1               ;transmit buffer empty flag
rbf     equ     2               ;receive buffer full flag
;
m1      equ     [illegible]     ;2 bits,no parity,1 stop bits
m2      equ     [illegible]     ;16x baud
c1      equ     [illegible]     ;rts and ti enables, DTR high
;
boot    equ     0000h
bdos    equ     0005h
dcio    equ     6               ;direct console i/o
;
        org     0100h
;
init:   mvi     a,m1            ;reset 8251 mode
        out     mode
        mvi     a,m2
        out     mode            ;mode word 2
        mvi     a,c1
        out     cmnd
;
loop:   mvi     c,06            ;this is where the start...
        mvi     e,0ffh          ;input a char
        call    bdos
        ora     a               ;is it really a char?
        jz      good            ;no, then check modem
;
        cpi     03h             ;^C?
        jz      boot            ;then reboot
        mov     b,a             ;save char
tit:    in      status          ;then transmit it
        ani     tbe             ;transmitter ready?
        jz      tit             ;no, then wait
        mov     a,b             ;get char back
        out     data            ;output it
        jmp     loop            ;and round again
;
good:   in      status          ;check modem status
        ani     rbf             ;received a char?
        jz      loop            ;no, then loop back
        in      data            ;else get it
        mov     e,a             ;and output it
        mvi     c,dcio          ;via the bdos
        call    bdos
        jmp     loop            ;and round again
        end
```

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nz scene

by Peter Isaac

SOME MICRO users are entitled to a rebate on their 40 per cent sales tax. Already a number of farmers are hitching their micros to process control work: automating battery hen feeding, for example. They are entitled to get their money back.

Here's what to do. The object of the exercise is to convince the Customs Department that the machine is being used only for process control applications.

Furthermore the Customs Department must be convinced that the machine is permanently embedded in the operation — they are on the lookout for machines that can be withdrawn from this application and used in general computing.

Amazingly, there has never been a single claim for this rebate. The money cannot be claimed when you purchase the machine; it is a rebate only. Ideally, the Customs Department should be presented with a set of photographs and drawings of the micro in its process control setting.

At the same time a little-known revision of the sales tax laws in 1976 also entitles farmers to a rebate if they can prove that their micro is used in process monitoring. The essential thing to prove is that the machine is exclusively dedicated to handling data on productivity. For example, it seems probable that a micro used on monitoring production from dairy herds, or breeding patterns, would qualify.

The precedent was recently set by the Waitaki Refrigeration company which received a rebate for a computer used for monitoring production on the killing chain.

The meat grader punches a series of buttons as the carcasses pass. These buttons demonstrate the grade, weight, destination and so on. The punch board interfaces with a ticket writer that automatically prints these and many other details on a ticket, and then consolidates all the information in a series of reports.

However, it must be voted that these computers are embedded, being housed on the freezing works floor and configured to undertake only this task.

The problem for farmers will be in demonstrating the embededness of their machines.

The Waitaki Refrigeration precedent proves conclusively that the computer does not have to control processes to warrant the rebate. It can monitor them as well and qualify.

The problem for farmers is clearly going to be proving that the computer, after performing its monitoring tasks, is not going to be switched back to general computing.

This all indicates that farmers instead of having one single powerful micro are better off having two. One for general business computing, the other exclusively dedicated to monitoring or control.

Government-sponsored pinball

The New Zealand Government appears to be conspiring to drive children into the computer games parlours which are being increasingly identified here as nests of juvenile crime.

Microcomputing companies are having serious problems in bringing in computer games that can be hitched to the family television set. This is because these attachments are classified as toys and in New Zealand toys are under the most rigorous import licenses. Unless you have a licence quota, you cannot bring in the toys.

It is becoming hard to obtain licences for the microchip games attachments, and the Customs Department insists on classifying them as toys. This classification is arrived at because the attachments being dedicated have no input, only output.

If an attachment has input and output, then the product is easily classified in the office equipment category, which is licence free.

So we find that the problem crops up with the ROM plug-ins. In contrast, cassettes carrying games in software form are in the office equipment category, and again are freely available.

The result is that ROM games on home television sets are still unusual. And the kids must go out to the parlours for their round of Space Invders.

Software Tax

About once every two years the commercial computing industry in New Zealand is filled with a sense of dread when the issue of the 40 per cent tax on software crops up.

The fact is that by law an importer must pay the 40 per cent on the wholesale value of the software, but who is to say if the tape is blank or loaded? And who decides if the software instructions it contains is worth $30 or $300,000?

With the price reversal in computing, the software becoming the most important element and the most costly, the Customs Department interest now rises more frequently.

With the increasing popularity of packages it becomes easier to define a price, but on the other hand many of the software packages are rented, again hard to assess.

Nobody is quite sure how the situation will resolve itself, but in the meantime quite a few importers are merely paying the duty on the raw value of the tape itself.

The significance of this on the micro user is evident. A cassette loaded with glossy label proclaiming its use and value is worth 40 per cent on the wholesale value to the New Zealand customs.

A raw tape is not taxed on the value of the instructions it contains. This is already leading to widespread transference of hobby programming and also substantial growth in home-grown programming freed of the big tax cut.

Q-man quits

Frank Ollie, microcomputing's most highly publicised individual, has left the industry (and New Zealand) probably for good. He resigned as managing director of David Reid Data Products and returned to his native Canada last month.

His departure was all the more surprising as he had successfully nurtured the David Reid Q-Series, New Zealand's first locally designed and assembled mini computer. According to Ollie he had to return to Canada to live for one year to avoid forfeiting his Canadian citizenship.

Ollie came to New Zealand 15 years ago to set up Digital Equipment Corp's operation here. He later joined David Reid and took the diversified electronics importing and distributing company into the microcomputer age. With the Radio Shack agency there was a time, in 1979, when David Reid had 70 per cent of the market.

Then Frank Ollie moved to take the lion's share of the burgeoning school market with a simple bulk buying deal with Auckland's Birkdale College.

Taking advantage of the auditor general's comments that it was time there was more group purchasing by the public sector, Ollie organised a nationwide schools bulk discount scheme through the College. Very efficiently managed, the Birkdale bulk buying scheme quickly became popular and gave David Reid a strong beachhead in what everyone now conceded is becoming the biggest single market in New Zealand for the micro-

computer.

But Ollie's biggest surprise came at the end of last year when in an almost matter of fact way he announced that this company had designed, built, and was marketing its own mini.

At first it seems that Frank Ollie was to have taken a year's leave of absence from David Reid, retaining his seat on the main group board, but then he decided to start afresh back home.

"A year is too long to be away," he commented. "In our industry it's almost an eternity."

Donald Reid now takes over as head of the family firm's computing operation.

Jet-Setter's Prime

Jet-set figure Lew Gyson has plunged headlong into the computer industry. After a long career as independent technology consultant he has become manager of Prime based in Wellington.

However, he continues in charge of his own firm Euro Gyson, an international consulting group dealing in high technology.

Gyson for eight years has advocated the establishment in Wellington of a Pacfic computer network centred in the capital city.

He belives the New Zealand expertise in centralised networks such as Databank give the country the experience to handle such a large assignment.

Farm Management Aid

Micro retailer Frank Goldingham of Palmerston North is selling a program aimed at the dairy farmer. It comes in both floppy disk and cassette versions for use on the TRS-80 and System 80. He anticipates versions for the Commodore will be available shortly.

The program, written by a Wairarapa dairy farmer, is mainly a management aid.

"If used with good stockmanship and careful pasture maintenance it will mean better individual performance from the cows," stresses Goldingham.

The program is basically designed for winter management, but can be used at any stage of the dairy season to match herd requirements against available feed resources. It has a particularly strong capability in predicting shortages and surpluses.

The cost of the cassette program is around $90, and Goldingham estimates that with a suitable keyboard and screen, a complete system cost a mere $1570.

Low-Paid Programmers

A bright future in programming as a career? Maybe, but not a super-paid one. In fact the mystique of computer specialists in New Zealand has just taken a blow with the publication of the top secret Wellington IBM Users Salary Survey, the de facto yardstick for all salaries in the industry in New Zealand.

The salary survey, which found its way into the unwelcome light of publicity, reveals that instead of being on par with brain surgeons or beer barons, the computing salaries are roughly comparable with those of secondary school teachers.

Applications programmers, the infantry of commercial computing, are a long way from the Croesus class. The highest salary actually paid to anyone included in the survey was $20,471, the lowest a mere $11,000, while the median salary was $14,362.

To Australian readers these sums must appear to be particularly low. These pay plackets explain why so many Kiwi programmers prefer to earn their living in Australia.

The average salary paid to 56 trainee programmers polled in the survey was $11,384. Trainee key station operators must be on the bread line. Thirteen of them were polled in the survey, and the highest salary paid to any individual was $8291; the lowest was a meager $4876.

Fully fledged computer operators did rather better. Seventy four of them were polled for the survey: the highest salary was $20,249, the average $12,000.

Eighty six systems designers and analyst programmers were polled; they had an average salary of $18,900.

The burden of this salaries report is that most public companies are including computer specialists in their general corporate pay structure. In New Zealand salaries paid to middle and low level corporate employees are notoriously low. This is one reason why sensible people work for the Government.

Significantly, the salaries paid to Air New Zealand computing specialists was not included in this survey. The payouts were so high that the IBM Users group decided that to include them would have been to distort the entire survey.

The modest nature of the salaries being paid by the large public companies polled in the survey also explains who so many specialists are now leaving regular employment and contracting, often with a back-to-back contract with one of the many consultants or facilities management groups.

Top of the tree in the Users Group survey were the systems development managers. But they too are a long-way from the Golden Fleece. Thirty-two were polled and their average salary was $25,897; the lowest was $17,500.

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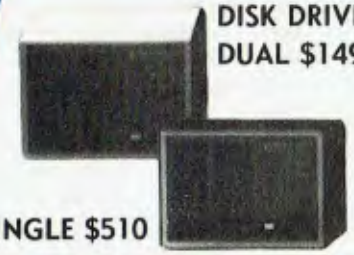

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things to be revealed in the survey was the absence of anything plush in the way of fringe benefits. Company cars were rare, and allowances seemed limited to the bare essentials. Obviously, the companies don't want their specialists on the two-hour lunch circuit.

No Favours For Poly

Go it alone. That's the chill message coming out of the Beehive whenever the issue of a blanket purchase of Polycorps by the Education Department comes up. It is now quite obvious that the Minister of Education Merv Wellington will not be instructing the Education Department to give the Polycorp "favoured nation" stauts.

The Polycorps will have to take their chance alongside the Radio Shacks, the Apples and the Ataris.

The reason for the Government's tacit decision is twofold. First was the furious lobby coming out of Auckland, the centre of microcomputing in New Zealand. The second has been the sharp swing to the right by the Government which is trimming away at public sector involvement in free enterprise-style operations.

However, an apparent decision by the Government to leave the schools market open need not mean the end of Polycorp. There has already been a substantial sale to schools in the Rotorua region,

and further sales are pending.

The rise of the New Zealand-integrated micro, most notably Microcomputer Development's MX Series, has also militated agains the Polycorp machine. And embroiled it in a fierce row as to the wisdom of taking manufacturing so far upstream. The Polycorp's PCBs are made in New Zealand.

ICL and NEC

ICL has ventured onto the high street with its own retail shop in Wellington's commercial area.

The store serves both the commerical and the hobby market with an array of spares, ribbons, and peripherals. ICL New Zealand chairman Laurie Cameron described the venture as an example of ICL's "continuing growth" in New Zealand.

NEC's first microcomputer to go on the market in New Zealand was launched here by the Japanese company's chairman Dr Koji Kobayashi. The PC8000 release here demonstrates Nippon Electric's aim to encompass both communications and computing, a favourite theme of Dr Kobayashi.

He believes that efforts over the next few years will focus on software engineering, especially in development and maintenance "so that software can be produced and quality controlled rationally and efficiently in spite of growing diversity, volume, and scale.".

He suggests that some automation could be introduced into the design and manufacture of software.

Among the latest in a flurry of new products aimed at the upper end of the micro market is Rank Xerox's 820 — the first Xerox micro to be released here.

The micro is aimed to include the word processor market and data processing. The keyboard/disk pack/VDU configuration is in the low price bracket for a commercial machine in New Zealand — around $6500.

But the addition of a matching quality printer brings this to close to $12,000 in total — underlining again the high cost of printers in New Zealand.

Slide The Letters

By Michael Phillips

REMEMBER the sliding letter games you used to get in the packets of breakfast cereal?

Yes? Well, this is an Applesoft program that simulates the game. When the program starts up it asks you if you need the instructions on how to play. If you want instructions, just press the 'Y' key for yes. There is no need to press the return key at all during the program as I have used the 'GET $' command.

Next the computer will randomly mix up the letter grid and display it. You press the key of a letter either vertically or horizontally adjacent to the space, which is represented by an asterisk.

The computer then checks that your move is a legal one. If it is not a legal move, three bells will sound (CTRL-G) and you will once againe be asked for your move. If it is a legal move, the letter you picked will be swapped with the asterisk.

The computer then checks to see if you have won the game or not. To win you must arrange the letters of the grid as shown:

```
A B C D
E F G H
I J K L
M N O *
```

If you have not won, you will be shown the new grid and asked for your next move. If you have won the computer will tell you so and ask if you want to play again or not.

```
LIST
10  DIM A$(4,4)
20  HOME
30  VTAB 12
40  PRINT "DO YOU WANT INSTRUCTIONS (Y/N)";
50  GET Z$
60  PRINT
70  IF Z$ = "Y" THEN  GOSUB 980
80  HOME
90  VTAB 12
100  PRINT "    WAIT WHILE I MESS UP THE LETTERS"
110 Z$ = "ABCDEFGHIJKLMNO*"
120 I = 1
130  FOR Y = 1 TO 4
140  FOR X = 1 TO 4
150 A$(X,Y) = MID$ (Z$,I,1)
160 I = I + 1
170  NEXT X
180  NEXT Y
190  GOSUB 270
200  GOSUB 960
210  VTAB 12
220  PRINT "WHICH LETTER >";
230  GET B$
240  PRINT B$
250  GOSUB 600
260  GOTO 200
270  FOR Q = 1 TO 100
280 X =  INT ( RND (1) * 4 + 1)
290  ON X GOTO 300,350,400,450
300  GOSUB 500
310  IF A - 1 < 1 THEN 280
320 A1 = A - 1
330 B1 = B
340  GOTO 550
350  GOSUB 500
360  IF B + 1 =  4 THEN 280
370 B1 = B + 1
380 A1 = A
390  GOTO 550
400  GOSUB 500
410  IF A + 1 > 4 THEN 280
420 A1 = A + 1
430 B1 = B
440  GOTO 550
450  GOSUB 500
460  IF B - 1 < 1 THEN 280
470 B1 = B - 1
480 A1 = A
490  GOTO 550
500  FOR A = 1 TO 4
510  FOR B = 1 TO 4
520  IF A$(B,A) = "*" THEN  RETURN
530  NEXT B
540  NEXT A
550 Z$ = A$(B1,A1)
560 A$(B,A) = Z$
570 A$(B1,A1) = "*"
580  NEXT Q
590  RETURN
600  FOR A = 1 TO 4
610  FOR B = 1 TO 4
620  IF A$(B,A) = B$ THEN 650
630  NEXT B
640  NEXT A
650  FOR C = 1 TO 4
660  FOR D = 1 TO 4
670  IF A$(D,C) = "*" THEN 700
680  NEXT D
690  NEXT C
700  IF B = 1 + J AND A = I THEN 730
710  IF B - 1 = D AND A = C THEN 730
720  IF A + 1 = C AND B = D THEN 790
730  IF A - 1 = C AND B = D THEN 790
740  PRINT  CHR$ (7); CHR$ (7); CHR$ (7)
750  PRINT "    ILLEGAL MOVE <<<<"
760  FOR Q = 1 TO 1000
770  NEXT Q
780  RETURN
790 Z$ = A$(B,A)
800 A$(D,C) = Z$
810 A$(B,A) = "*"
820  IF A$(1,1) = "A" AND A$(2,1) = "B" AND A$(3,1) = "C" AND A$(4,1) = "D
     " AND A$(1,2) = "E" AND A$(2,2) = "F" AND A$(3,2) = "G" AND A$(4,2) =
     "H" THEN 840
830  RETURN
840  IF A$(1,3) = "I" AND A$(2,3) = "J" AND A$(3,3) = "K" AND A$(4,3) = "L
     " AND A$(1,4) = "M" AND A$(2,4) = "N" AND A$(3,4) = "O" AND A$(4,4) =
     "*" THEN  GOSUB 860: PRINT "YOU'VE DONE IT !!": GOTO 1300
850  RETURN
860  HOME
870  FOR A = 1 TO 4
880  FOR B = 1 TO 4
890  VTAB A * 2
900  HTAB B * 2
910  IF B = 4 THEN  PRINT A$(B,A): GOTO 930
920  PRINT A$(B,A);"  ";
930  NEXT B
940  NEXT A
950  RETURN
960  HOME
970  HTAB 14
980  PRINT "INSTRUCTIONS"
990  PRINT
1000  PRINT "  THE GAME IS PLAYED ON A FOUR BY FOUR"
1010  PRINT "GRID. THE OBJECT OF THE GAME IS TO"
1020  PRINT "ARRANGE THE LETTERS (A-O) AS THEY ARE"
1030  PRINT "BELOW."
1040  PRINT : PRINT
1050  PRINT "A  B  C  D"
1060  PRINT
1070  PRINT "E  F  G  H"
1080  PRINT
1090  PRINT "I  J  K  L"
1100  PRINT
1110  PRINT "M  N  O  *"
1120  VTAB 24
1130  PRINT "PRESS "; CHR$ (123);"RETURN"; CHR$ (125);" TO CONTINUE";
1140  INPUT Q$
1150  HOME
1160  PRINT "  I WILL RANDOMLY ARRANGE THE LETTERS"
1170  PRINT "FOR YOU. THE  *  REPRESENTS A SPACE THAT";
1180  PRINT "THE LETTERS CAN BE MOVED INTO."
1190  PRINT
1200  PRINT "  TO MOVE A LETTER INTO THE SPACE YOU"
1210  PRINT "JUST PRESS THE LETTER ON THE KEYBOARD."
1220  PRINT
1230  PRINT "  ONLY LETTERS VERTICALLY AND"
1240  PRINT "HORIZONTALLY ADJACENT TO THE ASTERIX CAN";
1250  PRINT "BE MOVED INTO THE SPACE."
1260  VTAB 24
1270  PRINT "PRESS "; CHR$ (123);"RETURN"; CHR$ (125);" TO CONTINUE";
1280  INPUT Q$
1290  RETURN
1300  FOR I = 1 TO 2000
1310  NEXT I
1320  HOME
1330  VTAB 12
1340  PRINT "DO YOU WANT ANOTHER GAME (Y/N)";
1350  GET B$
1360  PRINT
1370  IF B$ = "Y" THEN  CLEAR : GOTO 10
1380  END
```

Rat Trap

By Brian Walsh

PEEP IS a program which reads and displays the contents of specified sections of any Random Access Text file created by Apple II's DOS 3.3.

This short program can be very useful. For example, if debugging a large program, PEEP allows you to check all writing to the RAT files.

The Apple II's MON function does a similar job but much of the information is lost from the screen as program execution continues. Any HOME commands in the program make MON virtually useless.

PEEP has inbuilt scroll control (line 290) to display the results in readable chunks. □

```
LIST

100  DIM A$(100)
110  HOME
120  VTAB (5): HTAB (17): INVERSE : PRINT "PEEP"
130  NORMAL
140  PRINT : PRINT : PRINT : PRINT
150  INPUT "         FILE NAME ?";FL$
160  INPUT "     RECORD LENGHT ?";RL
170  INPUT "      WHICH RECORD ?";RC
180  INPUT " NUMBER OF FIELDS ?";J
190 D$ =  CHR$ (4)
200  PRINT D$;"OPEN";FL$;",L";RL
210  PRINT D$;"READ";FL$;",R";RC
220  FOR I = 1 TO J
230  INPUT A$(I)
240  NEXT I
250  PRINT D$;"CLOSE";FL$
260  HOME
270  FOR I = 1 TO J: PRINT A$(I)
280  IF I / 5 =  INT (I / 5) THEN  PRINT
290  IF I / 10 =  INT (I / 10) THEN  PRINT : PRINT "PRESS ANY KEY TO CONTI
     NUE": GET G$: HOME
300  NEXT
310  PRINT : PRINT : INPUT "VIEW ANOTHER RECORD (Y OR N)? ";Q$
320  IF Q$ = "Y" THEN  HOME : GOTO 170
330  INPUT "  VIEW ANOTHER FILE (Y OR N)? ";Q$
340  IF Q$ = "Y" THEN 110
350  HOME : END
```

```
RUN
                PEEP

         FILE NAME ?AGGRO
      RECORD LENGHT ?300
       WHICH RECORD ?4
   NUMBER OF FIELDS ?32
69
76
57
71
53

58
63
62
81
52
PRESS ANY KEY TO CONTINUE
65
67
54
66
75

51
57
61
66
87


PRESS ANY KEY TO CONTINUE
74
59
64
56
93

75
67
76
74
76


PRESS ANY KEY TO CONTINUE
72
70


VIEW ANOTHER RECORD (Y OR N)? N
  VIEW ANOTHER FILE (Y OR N)? N
```

Space Chaser

By Bradley J Thurkettle

SPACE CHASER is based on the game of the same name distributed by TAITO in milkbars and pinball parlours.

The major difference is that the board is on its side and the chaser doesn't follow a set pattern but moves at you all the time (this is the big problem and to succeed you must exploit it).

Before running the program type: RUN 1620. To the question "your name champion?" simply type your name — the program creates a new file called "space chaser high score".

In this file is stored the high score and the high scorer's name. At the moment it holds your name and a score of 0. If you receive a message like: END OF DATA, BREAK IN 920 then you know the reason is you haven't created the high score file on the disk currently in the drive.

Simply go through the steps outlined above to fix the problem.

Hit any key to start!

The playing of the game is quite simple and the instructions given in the program itself are self-explanatory (Hint: When it says GET READY press 'i' or 'm' straight away, or else).

Variables

qe =1 when you want silence
fe fuel
n panel number
d$ control-D
hs$ high scorer's name
hs high score
a,b x,y co-ordinates of chaser

c,d x,y co-ordinates of chasee
t =20 for leaving point long enough to be visible
q ASCII value of last pressed key
q$ last pressed key
xx score
cl colour of next chaser's point
cr colour of next chasee's point
fg set to 1,2,3, or 4 to prevent running into walls □

```
10  REM   OPENING TITLE.
20  TEXT : CLEAR : HOME
30  FLASH
40  PRINT "      ****  ****  ****  ****  ****
50  PRINT "      *     *  *  *  *  *     *
60  PRINT "      ****  ****  ****  *     ***
70  PRINT "         *  *     *  *  *     *
80  PRINT "      ****  *     *  *  ****  ****
90  PRINT : PRINT
100 PRINT "   ****  *  *  ****  ****  ****  ****
110 PRINT "   *     *  *  *  *  *     *     *  *
120 PRINT "   *     *  *  *  *  *     *     *  *
130 PRINT "   *     ****  ****  ****  ***   ****
140 PRINT "   *     *  *  *  *     *  *     **
150 PRINT "   *     *  *  *  *     *  *     * *
160 PRINT "   ****  *  *  *  *  ****  ****  *  *"
170 NORMAL
180 PRINT : PRINT : PRINT : PRINT
190 REM     MY LOGO.
200 PRINT "THIS PROGRAM WAS DEVELOPED BY
210 FOR BJ = 1 TO 3000: NEXT : GR : COLOR= 9
220 HLIN 5,13 AT 2: HLIN 5,13 AT 10: HLIN 5,13 AT
     19: VLIN 3,9 AT 14: VLIN 11,18 AT 14: PLOT
     16,19: VLIN 2,19 AT 4: VLIN 11,17 AT 14
230 HLIN 18,27 AT 10: VLIN 11,27 AT 23: PLOT
     18,25: PLOT 19,26: HLIN 20,22 AT 27: PLOT
     25,27
240 HLIN 29,37 AT 22: VLIN 23,38 AT 33: PLOT 35,38
250 FOR BJ = 1 TO 3000: NEXT : TEXT : HOME
260 REM    START OF GAME
     (INSTRUCTIONS)
270 PRINT "HIT ANY KEY TO CONTINUE": GET ANS$
280 HOME
290 SPEED= 255
300 PRINT "DO YOU NEED INSTRUCTIONS": GET F$
310 IF F$ = "Y" THEN  HOME : GOTO 340
320 IF F$ = "N" THEN 450
330 GOTO 300
340 PRINT  TAB( 14);"INSTRUCTIONS"
350 PRINT  TAB( 14);"------------"
360 PRINT : PRINT : PRINT
370 PRINT "THE IDEA OF THE GAME IS TO AVOID THE
     CHASER. THIS IS ACCOMPLISHED BY KEEPING YOUR
     SPACE VECHICLE ( THE PURPLE ONE ON THE RIGHT
     ) AWAY FROM THE CHASER          ( THE LIGHT
     BLUE ONE TO THE LEFT OF      SCREEN )."
380 PRINT : PRINT : PRINT
390 PRINT "TO MOVE YOUR  SHIP PRESS:-"
400 PRINT "  I...UP"
410 PRINT "  M...DOWN"
420 PRINT "  J...LEFT"
430 PRINT "  K...RIGHT"
440 VTAB 22
450 PRINT "DO YOU WANT ME TO SPEED UP ?": GET Z$
     IF Z$ = "Y" THEN ST = 1
460 REM SET FUEL AND NEXT SCREEN
470 HOME : GR
480 CLEAR
490 FE = 5000
500 FE = FE + 3500 - (100 * N):N = N + 1
510 ON N GOSUB 520,530,530,530,530
520 GR
530 COLOR= 15
540 HLIN 0,39 AT 0: HLIN 0,39 AT 39
550 HLIN 5,18 AT 5: HLIN 23,36 AT 5
560 HLIN 9,18 AT 9: HLIN 23,32 AT 9
570 HLIN 13,18 AT 18: HLIN 23,28 AT 18
580 HLIN 13,18 AT 23: HLIN 23,28 AT 23
590 HLIN 9,18 AT 32: HLIN 23,32 AT 32
600 HLIN 5,18 AT 36: HLIN 23,36 AT 36
610 VLIN 0,39 AT 0: VLIN 0,39 AT 39
620 VLIN 5,18 AT 5: VLIN 23,36 AT 5
630 VLIN 9,18 AT 9: VLIN 23,32 AT 9
640 HLIN 13,28 AT 13: HLIN 13,28 AT 28
650 VLIN 9,18 AT 32: VLIN 23,32 AT 32
660 VLIN 5,18 AT 36: VLIN 23,36 AT 36
670 PLOT 20,21: PLOT 20,20: PLOT 21,20: PLOT 21,21
680 COLOR= 12
690 PLOT 3,3: PLOT 6,3: PLOT 9,3: PLOT 12,3: PLOT
     15,3: PLOT 18,3: PLOT 21,3: PLOT 24,3: PLOT
     27,3: PLOT 30,3: PLOT 33,3: PLOT 36,3: PLOT
     38,3
700 PLOT 3,6: PLOT 3,9: PLOT 3,12: PLOT 3,15: PLOT
     3,18: PLOT 3,24: PLOT 3,27: PLOT 3,30: PLOT
     3,33: PLOT 3,36: PLOT 3,38
710 PLOT 3,38: PLOT 6,38: PLOT 9,38: PLOT 12,38:
     PLOT 15,38: PLOT 18,38: PLOT 21,38: PLOT
     24,38: PLOT 27,38: PLOT 30,38: PLOT 33,38:
     PLOT 36,38: PLOT 38,38
720 PLOT 38,6: PLOT 38,9: PLOT 38,12: PLOT 38,15:
     PLOT 38,18: PLOT 38,24: PLOT 38,27: PLOT
     38,30: PLOT 38,33: PLOT 38,36
730 PLOT 7,7: PLOT 7,10: PLOT 7,13: PLOT 7,16:
     PLOT 7,25: PLOT 7,28: PLOT 7,31: PLOT 7,34
740 PLOT 20,3: PLOT 20,38
750 PLOT 11,11: PLOT 11,14: PLOT 11,17: PLOT
     11,20: PLOT 11,23: PLOT 11,26: PLOT 11,27:
     PLOT 11,30: PLOT 11,34
760 PLOT 14,11: PLOT 14,16: PLOT 14,17: PLOT
     14,20: PLOT 14,21: PLOT 14,25: PLOT 14,26:
     PLOT 14,30: PLOT 14,34
770 PLOT 17,7: PLOT 17,11: PLOT 17,15: PLOT 17,16:
     PLOT 17,20: PLOT 17,21: PLOT 17,25: PLOT
     17,26: PLOT 17,30: PLOT 17,34
780 PLOT 20,5: PLOT 20,8: PLOT 20,11: PLOT 20,15:
     PLOT 20,16: PLOT 20,25: PLOT 20,26: PLOT
     20,30: PLOT 20,34
790 PLOT 23,5: PLOT 23,8: PLOT 23,11: PLOT 23,15:
     PLOT 23,16: PLOT 23,20: PLOT 23,25: PLOT
     23,26: PLOT 23,30: PLOT 23,34
800 PLOT 26,7: PLOT 26,11: PLOT 26,15: PLOT 26,16:
     PLOT 26,20: PLOT 26,21: PLOT 26,25: PLOT
     26,26: PLOT 26,30: PLOT 26,34
810 PLOT 27,7: PLOT 27,11: PLOT 27,15: PLOT 27,16:
     PLOT 27,20: PLOT 27,21: PLOT 27,25: PLOT
     27,26: PLOT 27,30: PLOT 27,34
820 PLOT 30,7: PLOT 30,11: PLOT 30,15: PLOT 30,16:
     PLOT 30,20: PLOT 30,21: PLOT 30,25: PLOT
     30,26: PLOT 30,30: PLOT 30,34
830 PLOT 34,7: PLOT 34,10: PLOT 34,13: PLOT 34,16:
     PLOT 34,25: PLOT 34,28: PLOT 34,31: PLOT
     34,34
840 PLOT 17,7: PLOT 14,7: PLOT 17,7
850 PLOT 6,20: PLOT 6,23: PLOT 8,20: PLOT 9,20:
     PLOT 11,20: PLOT 11,23: PLOT 11,20: PLOT
     38,31
860  HTAB 10: INVERSE : PRINT "GET READY"
870  NORMAL
880  REM    READ FROM TEXT FILE   CURRENT HIGH
      SCORER'S SCORE           AND NAME.
890 D$ =  CHR$ (4): REM  CONTROL-D
900  PRINT D$;"OPEN SPACE CHASER HIGH SCORE"
910  PRINT D$;"READ SPACE CHASER HIGH SCORE"
920  INPUT HS,HS$
930  PRINT D$;"CLOSE SPACE CHASER HIGH SCORE"
940  REM    MAIN PROGRAMME.
950  PRINT : PRINT : PRINT
960 A = 2:B = 20:C = 37:D = 20
970  COLOR= 7: PLOT A,B
980  COLOR= 3: PLOT C,D
990  FOR T = 1 TO 20: NEXT
1000  COLOR= 0
1010  PLOT C,D
1020  IF CO = 12 THEN DC = 12
1030  COLOR= DC: PLOT A,B
1040 DC = 0
1050 Q =  PEEK ( - 16384)
1060  IF Q > 127 THEN  POKE  - 16368,0
1070  IF Q > 127 THEN Q$ =  CHR$ (Q - 128)
1080 FE = FE - 5
1090  IF FE < 0 THEN  PRINT "FUEL GONE": GOTO 1380
1100  IF XX = 1500 * N THEN 500
1110  VTAB 22: PRINT "SCORE = ";XX,"
     FUEL=";FE
1120  VTAB 23: PRINT "HIGH SCORE = ";HS;"     BY
     ";HS$
1130  IF Q$ = "I" THEN D = D - 1
1140  IF Q$ = "M" THEN D = D + 1
1150  IF Q$ = "J" THEN C = C - 1
1160  IF Q$ = "K" THEN C = C + 1
1170  IF Q$ <  "I" AND Q$  > "M" AND Q$ <
     "J" AND Q$  "K" THEN FE = FE + 4
1180 CL =  SCRN( C,D)
1190  IF CL = 15 THEN  GOSUB 1490
1200  IF CL = 12 THEN XX = XX + 10: VTAB 1: GOSUB
     1780
1210  IF A < C THEN FG = 1:A = A + 1
1220  IF A > C THEN FG = 2:A = A - 1
1230 CR =  SCRN( A,B)
1240  IF CR = 15 THEN  GOSUB 1540
1250 FG = 0
1260  IF B < D THEN FG = 3:B = B + 1
1270  IF B > D THEN FG = 4:B = B - 1
1280 CO =  SCRN( A,B)
1290  IF CO = 15 THEN  GOSUB 1540
1300  IF A = C AND B = D THEN 1380
1310  GOTO 970
1320  IF C > (A) THEN FG = 1:A = A + 1
1330  IF C < (A) THEN FG = 2:A = A - 1
1340  IF D > B THEN FG = 3:B = B + 1
1350  IF D < B THEN FG = 4:B = B - 1
1360  IF XX = 1500 * N THEN  GOTO 500
1370  IF A = C AND B = D THEN 1380
1380  TEXT : HOME
1390  HTAB 4: VTAB 7: PRINT "YOUR FINAL SCORE WAS
     =+* ";XX;" *+=-"
1400  VTAB 7: PRINT "YOU HAD =+* ";FE;" *+=-";"
     FUEL UNITS LEFT."
1410  VTAB 24: POKE 34,23: PRINT "PRESS THE SPACE
     BAR TO CONTINUE.";: GET AN$: IF AN$ = " "
     THEN 1430
1420  PRINT : GOTO 1410
1430  TEXT : HOME : NORMAL : SPEED= 255
1440  IF XX > HS THEN  GOTO 1620
```

```
1450  PRINT "DO YOU WANT ANOTHER GO ? ";: GET B$
1460  IF B$ = "N" THEN  END
1470  IF B$ = "Y" THEN  HOME : GOTO 450
1480  GOTO 1430
1490  IF Q$ = "I" THEN D = D + 1
1500  IF Q$ = "M" THEN D = D - 1
1510  IF Q$ = "J" THEN C = C + 1
1520  IF Q$ = "K" THEN C = C - 1
1530  RETURN
1540  IF FG = 1 THEN A = A - 1
1550  IF FG = 2 THEN A = A + 1
1560  IF FG = 3 THEN B = B - 1
1570  IF FG = 4 THEN B = B + 1
1580 FG = 0
1590  RETURN
```

```
1600  REM  STOP CHASER PICKING UP DOTS
1610  GOTO 1050
1620 D$ =  CHR$ (4): REM  CONTROL-D
1630  INPUT "YOUR NAME, CHAMPION";CHAMP$
1640  PRINT D$;"OPEN SPACE CHASER HIGH SCORE"
1650  PRINT D$;"WRITE SPACE CHASER HIGH SCORE"
1660  PRINT XX
1670  PRINT CHAMP$
1680  PRINT D$;"CLOSE SPACE CHASER HIGH SCORE"
1690  VTAB 22: PRINT "YOU'VE DONE WELL CHAMP."
1700  VTAB 23: PRINT "HERE IS YOUR MEDAL."
1710  PRINT "ADMIRE IT FOR A WHILE."
1720  GR
1730  COLOR= 9: VLIN 10,19 AT 16: VLIN 10,19 AT 17:
      VLIN 10,19 AT 24: VLIN 10,19 AT 25: COLOR=
      12: VLIN 10,19 AT 18: VLIN 10,19 AT 19: VLIN
      10,19 AT 22: VLIN 10,19 AT 23
1740  COLOR= 13: VLIN 10,29 AT 20: VLIN 10,29 AT
      21: HLIN 18,23 AT 22: HLIN 18,23 AT 23: HLIN
      18,23 AT 26: HLIN 18,23 AT 27: HLIN 18,25 AT
      24: HLIN 18,25 AT 25
1750  COLOR= 9: PLOT 20,24: PLOT 21,24: PLOT 20,25:
      PLOT 21,25
1760  FOR BJ = 1 TO 3000: NEXT
1770  GOTO 1450
1780  IF QT = 0 THEN  RETURN
1790  FOR BJ = 1 TO 4:X =  PEEK ( - 16336) -  PEEK
      ( - 16336) -  PEEK ( - 16336) -  PEEK ( -
      16336): NEXT : RETURN
```

Apple Disk Copy

By Steven Zanker

FOR THOSE Apple owners who have only one disk drive, here is welcome relief from the frustrations of using the supplied diskette COPY program on the system master.

It's frustrating because the program only reads a small portion of the diskette before copying onto the duplicate disk — meaning constant changing of the disks. As most Apple systems are purchased or eventually upgraded to 48K, this represents gross inefficiency and valuable time wasted.

This article presents a copy program that will use the memory efficiently, enabling a faster copy time. The program was built around the RWTS subroutine described in the DOS manual. At this point I suggest you read pages 94 to the top of page 96, ignoring the second and third sentences in the first paragraph.

What It Told You...

Briefly revising: You learned that the diskette is divided into 35 tracks (numbered 0 to 34), each track divided into 16 sectors (0 to 16), and each sector contains 256 bytes; making 143,360 bytes or 560 sectors.

You also read about a section of memory, called a buffer, which incidently is both the minimum and maximum of information that can be read or written by the RWTS subroutine. These facts will help you understand how the following program works.

A short program loaded at either end of the available memory will mean more than 33,000 bytes of free RAM; slightly greater than a fifth of the total storage of the diskette. Therefore if the program reads 20 percent of one disk, and duplicates it on another disk, an entire copy can be made in five 'passes'.

Here is a description of the program:

Line 100 sets HIMEM to protect the 112 buffers needed for a single pass (560 sectors/5 passes = 112).

Lines 2000 to 2999 display the maps of the 'Controlling Subroutine', the 'Input/output Block', the 'Device Characteristics Table', and the portions of these areas which are changed during program execution. A user interface section begins at line 4000, requiring the slot, drive and volume numbers.

The drive question is really unnecessary, as your system will not work with its only drive connected to the 'drive 2' pins. It remains only to accustom you to the question, which often appears in disk utilities.

The source volume is the volume number you wish to be placed on the duplicate diskette. If you want the volume numbers to be equal then delete line 4400.

Line 4460 reminds you to insert the object disk first, for the line after the next INITs the object disk. This line enables you to use blank diskettes.

If you feel dubious about leaving these lines (4460 - 4520) in, delete them and remember to initialise all object disks before running the program.

Remember: INIT kills the whole disk if it is not write-protected, and INIT plus Visitors means *trouble*.

The actual copy cycle begins at line 6000, and is controlled by the PASS For/next Loop. Line 6040 clears the error locations, and an interrupt at 6060 allows insertion of the original disk. Each pass consists of a 'read and dump' section and a 'copy and dump' section. The read section begins at line 6080 where the expected volume number (source volume) is poked into the I/O Block.

Line 6100 resets the buffer pointers, and the command code is set to read (=1) at 6120. Double inner loops, for the 7 tracks and the 16 sectors for each track are then performed; the values for each being poked into the IOB. At line 6220 the high byte of the buffer address for the sector being read is incremented by 1.

Note that any high byte of an address is multiplied by 256, and you will recall that each sector contains 256 byte. The buffer map therefore looks like this during the first pass:

BUFFER CONTENTS		HIGH BYTE	BUFFER STARTING ADDRESS (DEC)
Track	Sector		
6	15($F)	149	38144
6	14($E)	148	37888
6	13($D)	147	37632
6	12($C)	146	37376
~	~	~	~
0	3	41	10496
0	2	40	10240
0	1	39	9984
0	0	38	9728

After updating the IOB, the controlling subroutine is called. At this stage we will enter the monitor, list and explain the controlling subroutine located at 768 ($300 hexadecimal).

0300 — A9 03 LDA # $03
0302 — A0 20 LDY # $20

These 4 bytes simply load the accumulator and Y-register with the location of the I/O Block. The RWTS subroutine must have the values these registers contain.

0304 — 20 D9 03 JSR $03D9

JSR is machine language command similar to BASICs GOSUB, except the numbers after the operation code $20 refer to not a line number, but a memory location made up of low-byte followed by high-byte.

0307 — B0 01 BCS $030A

BCS is Branch on Carry Set. Page 97 of the DOS manual under the heading 'IBSTAT' tells us that if an error occurrs during the operation of the RWTS, the carry flag (a single bit in the processor status register) will be set to 1. This operation checks that bit, and if set, will cause a jump over 01 bytes to 30A. If the flag is not set, this command is ignored.

0309 — 60 RTS

RTS is similar to BASIC's RETURN. In this

case it executes a return to BASIC and the statement following the CALL.

030A — A9 80 LDA # $80
030C — 8D 40 03 STA $0340
030F — 18 CLC
0310 — 60 RTS

This routine simply indicates to the basic program that an error has occurred. It first loads the accumulator with $80 (Decimal 128), then stores it in the error indicator location, clears the carry flag, and returns to the program.

Back in the BASIC program, after the CALL statement is executed, the error location is PEEKed at to determine if an error did occurr (line 6260). If there was an error, the next sector is read, and the program loops until all seven tracks have been read.

After the tracks have been read, an interrupt occurrs, allowing the user to swap disks. The writing section is similar to that of the read, except the contents of each buffer is copied onto the duplicate disk. Note that the volume and command codes differ.

And thus a single pass is completed. After the loop has been performed another four times the copy cycle is finished; a catalogue of the duplicate disk is displayed, and HIMEM is reset to maximum (lines 8000 to 8060).

The error routine handles all the errors described on page 97 of the manual, under the heading 'IBSTAT'. Most of these display correcting instructions, and the program pauses while the user follows same. Program execution aborts after the same error occurs three times during the access of any one sector.

Line 10020 clears the error indicator then a branch to the top of error is made. The read error is handled differently. This results when the RWTS attempts to read a portion of the disk which has not been previously written on. When this error occurs for the first time, the buffer for that sector is zeroed (line 10900) and the program attempts to re-read the sector again. If the error occurrs the second time, it is ignored, and control passes back to the copy section. This means any unused portion on the original disk is filled with zeros on the duplicate.

The time taken for actual read or write loop is 24 seconds. Allowing five seconds for change of disks, this means a complete copy can be made in 4.75 minutes. I timed both this program and the system's Copy program on the same diskette — Apple's version took some eight minutes 41 seconds with 30 passes (swap disks 60 times).

My program took only 4 minutes 32 seconds with five passes (swap disks 9 times). This represents a vast improvement and an end to some of the frustrations of single drive users.

Mods For Smaller Systems

With 36K — 7 passes instead of 5, each pass accessing only 5 tracks. Reset buffer high-byte (lines 6100 & 6380) to 21. Set HIMEM (line 100) to 5631.

Less than 36K — Programs needs to be modified to one of two methods: equal number of sectors copied per pass, some tracks split between 2 passes; or full tracks copied during each pass, the final pass copying a few less.

Whichever method you use, don't forget to calculate the HIMEM and buffer high byte values.

Footnotes...

- Always write-protect your original diskettes before using this or any other copy program.
- To type any characters not directly available from the keyboard, use an immediate mode print statement; for example, PRINT CHR$ (91). Then, using the edit keys, move the cursor over that character and copy, when required. Or in the case of the backslash (used in this program), type Control-X and copy the entire line. □

```
10  REM SINGLE DRIVE DISK COPY
100  HIMEM: 9720
200  REM /--------------------\
220  REM !                    !
240  REM !    DOS 3.3   48K   !
260  REM !    SINGLE  DRIVE   !
280  REM !  DISK COPY UTILITY !
300  REM !                    !
320  REM !  AUTHOR:  S.ZANKER !
340  REM !  WRITTEN:  12FEB82 !
360  REM !                    !
380  REM \--------------------/
500  REM <> VARIABLES <>
520 A = 0:B = 0
540 ANSWER$ = ""
560 D$ =  CHR$ (4)
580 DRIVE = 0
600 G$ =  CHR$ (7)
620 OVOBJECTVOL = 0
640 PASS = 0
660 SECTOR = 0
680 SLOT = 0
700 SVSOURCEVOL = 0
720 TRACK = 0
2000  REM <> BYTE MAPZ <>
2020  REM ++ RWTS MAP ++
2040  REM 768-84=CONTROL SUB
2060  REM 800-16=IOB
2080  REM 817-20=DCT
2100  REM 832-37=ERROR TABLE
2120  REM + LOCATIONS ACCESSED +
2140  REM -----IOB-----
2160  REM 801  =SLOT NUMBER * 16
2180  REM 802  =DRIVE NUMBER
2200  REM 803  =VOLUME NUMBER
2220  REM 804  =TRACK NUMBER
2240  REM 805  =SECTOR NUMBER
2260  REM 808&9=BUFFER ADDRESS
2280  REM 812  =COMMAND CODE
2300  REM 813  =ERROR CODE
2320  REM 814  =ACTUAL VOLUME
2340  REM 815  =PREVIOUS SLOT
2360  REM 816  =PREVIOUS DRIVE
2380  REM -----ERROR TABLE-----
2400  REM 832  =ERROR FLAG(=128)
2420  REM 833  =ERROR COUNT
2440  REM 834  =WRITE-PROTECT
2460  REM 835  =VOLUME MISMATCH
2480  REM 836  =DRIVE
2500  REM 837  =READ
2520  FOR SV = 768 TO 820: READ OV: POKE
      SV,OV: NEXT SV
2540  DATA
      169,3,160,32,32,217,3,176,1,96,169,
      128,141,64,3,24,96,0,0,0,0,0,0,0,0,
      0,0,0,0,0,0,0,1,96,1,0,18,6,49,3,34
      ,34,0,0,1,0,0,96,1,0,1,239,216
4000  REM <> INTERROGATION <>
4020  TEXT : HOME : INVERSE
4040  PRINT
      "/--------------------------------
      -----\";
4080  PRINT "!   DOS 3.3, 48K   DISK COPY
      UTILITY   !";
4100  PRINT "!
      !";
4120  PRINT "! AUTHOR: S.ZANKER
      WRITTEN: 12FEB82 !";
4160  PRINT
      "\--------------------------------
      -----/"
4180  NORMAL : POKE 34, PEEK (37) - 1
4200  VTAB 10: INVERSE : PRINT "SLOT
      NUMBER (1-6) ";: NORMAL : INPUT
      AN$: IF AN$ = "" THEN 8080
4220 SLOT =  INT ( VAL (AN$)): IF SL < 1
      OR SL > 6 THEN  PRINT G$: GOTO 4200
4240  POKE 801,SLOT * 16
4260  VTAB 14: INVERSE : PRINT "DRIVE
      NUMBER (1) ";: NORMAL : INPUT AN$:
      IF AN$ = "" THEN  PRINT G$: GOTO
      4200
4280 DRIVE =  INT ( VAL (AN$)): IF DRIVE <
      > 1 THEN  PRINT G$: GOTO 4260
4300  POKE 802,DRIVE
4320  VTAB 18: INVERSE : PRINT "SOURCE
      DISK VOLUME (1-254) ";: NORMAL :
      INPUT AN$: IF AN$ = "" THEN  PRINT
      G$: GOTO 4260
4340 SV =  INT ( VAL (AN$)): IF SV < 1 OR
      SV > 254 THEN  PRINT G$: GOTO 4320
4360  VTAB 22: INVERSE : PRINT "VOL NUMBER
      FOR OBJECT DISK (1-254)";: NORMAL :
```

```
      INPUT AN$: IF AN$ = "" THEN  PRINT
      G$: GOTO 4320
4380 OV =  INT ( VAL (AN$)): IF OV < 1 OR
      OV > 254 THEN  PRINT G$: GOTO 4360
4400  IF SV = OV THEN  PRINT G$: GOTO 4320
4420  HOME : VTAB 16: FLASH
4440  POKE 815,SLOT * 16: POKE 816,DRIVE
4460  INPUT " INSERT OBJECT DISK FOR
      INITIALISATION           AND PRESS
      RETURN ONLY          ";AN$: NORMAL
      : IF AN$ <  > "" THEN 4000
4480  PRINT D$"MON C"
4500  PRINT D$"INIT COPY,S";SL;",D1,V";OV
4520  PRINT D$"NOMON C": HOME : VTAB 24
6000  REM <> COPY SECTION <>
6020  FOR PASS = 0 TO 4
6040  FOR A = 0 TO 5: POKE 832 + A,0: NEXT
6060  INPUT "INSERT SOURCE DISK AND PRESS
      RETURN";AN$: IF AN$ <  > "" THEN
      8080
6080  POKE 803,SV
6100  POKE 809,37: POKE 808,0
6120  POKE 812,1
6140  FOR TRACK = PASS * 7 TO PASS * 7 + 6
6160  POKE 804,TRACK
6180  FOR SECTOR = 0 TO 15
6200  POKE 805,SEC
6220  POKE 809, PEEK (809) + 1
6240  CALL 768
6260  IF  PEEK (832) > 127 THEN  GOSUB
      10000
6280  NEXT SEC,TRACK
6300  PRINT : PRINT
6320  PRINT "READ #";PASS;" DONE:"
6340  INPUT "INSERT OBJECT DISK AND PRESS
      RETURN";AN$: IF AN$ <  > "" THEN
      8080
6360  POKE 803,OV
6380  POKE 809,37: POKE 808,0
6400  POKE 812,2
6420  FOR TRACK = PASS * 7 TO PASS * 7 + 6
6440  POKE 804,TRACK
6460  FOR SECTOR = 0 TO 15
6480  POKE 805,SEC
6500  POKE 809, PEEK (809) + 1
6520  CALL 768
6540  IF  PEEK (832) > 127 THEN  GOSUB
      10000
6560  NEXT SEC,TRACK
6580  PRINT "PASS #";PASS;" COMPLETED:"
6600  IF PASS = 3 THEN  INVERSE : PRINT
      "LAST PASS COMING UP!": NORMAL
6620  NEXT PASS
8000  REM <> END OF COPY <>
8020  TEXT : PRINT D$"CATALOG"
8040  INVERSE : PRINT "END OF PROGRAM.":
      NORMAL : VTAB  PEEK (37)
8060  HIMEM: 38400: END
8080 A =  PEEK (37): TEXT : VTAB A: HIMEM:
      38400: STOP : GOTO 64000
10000  REM <> ERROR HANDLING <>
10020  POKE 832,0
10040  IF  PEEK (813) = 16 THEN 10200
10060  IF  PEEK (813) = 32 THEN 10400
10080  IF  PEEK (813) = 64 THEN 10600
10100  IF  PEEK (813) = 128 THEN 10800
10120  GOTO 8080
10200  REM <> WRITE-PROTECTED <>
10220  FLASH : PRINT "WRITE PROTECTED";G$:
      NORMAL
10240  POKE 833, PEEK (833) + 1: POKE 834,
      PEEK (834) + 1
10260  PRINT "REMOVE WRITE-PROTECT LABEL"
10280  POP : GOTO 6340
10400  REM <> VOLUME <>
10420  FLASH : PRINT "VOLUME MISMATCH";G$:
      NORMAL
10440  POKE 833, PEEK (833) + 1: POKE 835,
      PEEK (835) + 1: IF  PEEK (835) > 2
      THEN 8080
10460  IF  PEEK (803) = OV THEN  POP :
      GOTO 6340
10480  IF  PEEK (803) = SV THEN  POP :
      GOTO 6060
10500  GOTO 8080
10600  REM <> DRIVE <>
10620  FLASH : PRINT "DRIVE ERROR";G$:
      NORMAL
10640  POKE 833, PEEK (833) + 1: POKE 836,
      PEEK (836) + 1: IF  PEEK (836) > 2
      THEN 8080
10660  INPUT "CHECK DRIVE DOOR AND PRESS
      RETURN";AN$: IF AN$ <  > "" THEN
      8080
10680  POP : GOTO 6080
10800  REM <> READ <>
10820  FLASH : PRINT "READ ERROR";G$:
      NORMAL
10840  POKE 833, PEEK (833) + 1: POKE 837,
      PEEK (837) + 1
10860  ON  PEEK (837) GOTO 10900,10940
10880  GOTO 8080
10900 A =  PEEK (808) +  PEEK (809) * 256:
      FOR B = A TO A + 255: POKE B,0:
      NEXT B
10920  POP : GOTO 6080
10940  PRINT "TRACK #";TR;", SECTOR
      #";SEC;" CONTAINS A READ"
10960  PRINT "   ERROR: LOOK P97 DOS
      MANUAL ('IBSTAT')"
10980  PRINT "   THE UNWRITTEN AREA ON THE
      COPY DISK"
11000  PRINT "   WILL BE FILLED WITH
      ZEROS. RUN CONT."
11020  POKE 837,0: RETURN
```

Applejous – For A Lissajous Figure

By Jonathan Masters

APPLEJOUS is a dramatic demonstration of the hires graphics facilities of the Apple microcomputer. It plots the intersection of two sine waves on the fashion of a lissajous figure (a variation of which is the ABC television logo).

Such figures may easily be generated on an oscilloscope with several oscillators. Since we have a much more versatile and powerful tool at our finger tips we will similate this method on that.

Lissajous figures are fascinating closed curves that change according to input frequencies and phase differences. Figure 1 gives an idea of the principal of plotting such a figure.

The program emulates this method by creating two oscillators. Both oscillations are dependant of time so that the values from each wave may be used as our x and y values. The frequency of oscillation for each wave is determined by the variables f1 and f2. F2's curve lags f1 by phase difference p.

Variables:

P — phase: not accounted for in figure 1. Move t0 forward on wave 1 causing changes in curve symmetry.

A — amplitude: changes overall size of plot. Input may be changed to let a=40 to avoid keystrokes.

F1,F2 — frequencies: changes frequencies of the plotted wave creating more or less intricate patterns.

S — step: changes the increment in time allowing for faster plots with less resolution or slower plots with higher resolution.

TIME,T — time: the For/next variable representing time. This variable is the basis for the creation of the oscillators.

X,Y,XX,YY: plotting variables.

Several things may also be noted about this program:

(i) all inputs are in degrees. The machine converts to radians by multiplying by 0.0174533

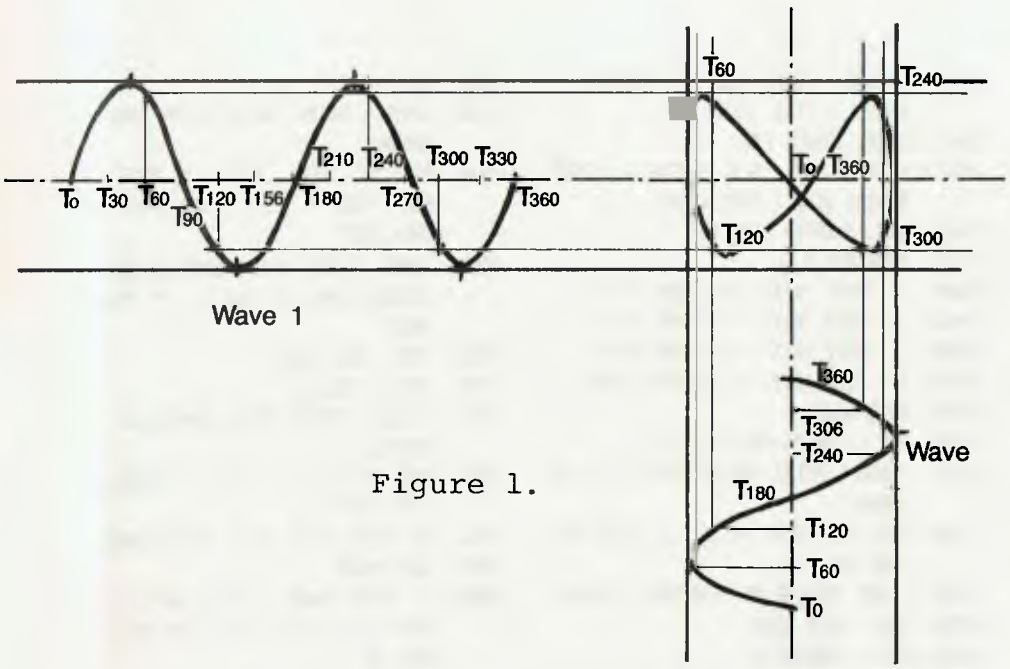

Figure 1.

(ii) Biasing values of 130 and 70 are added to the x and y values respectively to centre the figure in the screen and to prevent errors due to the plotting values going negative.

(iii) The variables XX and YY are the old values of x and y (used to obtain smooth continuous plots). Where there are no old values of x and y, ie. t=0, then xx=x and yy=y. (see line 130)

Many improvements may be made to this program, including simultaneous plotting of several figures in colour, exponential decay of amplitudes of each of the oscillations, and changing the phase angle while continuously plotting to obtain rotating figures.

It is quite obvious the program may be expanded to include some interesting features. Experiment and see what you can come up with.

```
5   REM APPLEJOUS - A LISSAJOUS FIGURE
    PROGRAM FOR THE APPLE
7   REM WRITTEN BY JON MASTERS FOR THE
    APPLE II+
10  HOME:TEXT:NORMAL
20  PRINT "APPLEJOUS-HIRES LISSAJOUS
    FIGURE PLOT"
30  PRINT:PRINT:PRINT:PRINT
40  INPUT "AMPLITUDE";A
50  INPUT "RATIO F1:F2";F1,F2
60  INPUT "PHASE
    DIFFERENCE";P:P=P*0.0174533
70  INPUT "STEP";S
80  REM WE HAVE THE PLOT PARAMETERS NOW
100 HGR
140 FOR TIME=0 TO 360
150 T=TIME*0.0174533
160 X=SIN(T*F1+P)*A+130
170 Y=SIN(T*F2)*A+70
180 IF T=0 THEN XX=X:YY=Y
190 HPLOT XX,YY TO X,Y
200 NEXT TIME
```

TRS-80

Basic Subroutine Facility

By R D Greet

THIS article is directed, mainly, at TRS-80 Model 1 Disk Basic users; however, it is hoped that others may be able to adapt the procedures contained herein for other systems.

There has been mich dialogue on the subject of implementation of machine code subroutines that are to be invoked from Basic.

The method presented here — though not original — is, in my opinion, the easiest and most effecient; provided that such subroutines are fully relocatable and do not exceed 233 bytes in length. Additionally, as a by-product, a method of appending non-ASCII files will be described.

The first step required, of course, is to write the subroutines and obtain the object code. Once done, the following method can be used to build this code into BASIC program lines (a separate line for each subroutine).

From BASIC command mode, enter the selected line number (subroutine line numbers must be greater than the highest line number used in standard text), an apostrophe (REM token), a count of the number of code bytes that follow (described later), a semi-colon delimiter followed by as many blanks as there are bytes in the object code. This provides a potential shell for the code.

The next step is achieved from Debug; key CMD'D to call up Debug, using 'D' command, display memory location 40A4H — the pointer to the program statement table or, less formally, the start of BASIC text.

You should now have, on screen, a resemblence of Fig. 2. Againe using 'D', display the memory location as addressed by locations 40A5H (msb) and 40A4H (lsb). This will now display the shell line as indicated on Fig. 2. Of course if the line under preparation is not the actual first statement line resident in the buffer, as would be the case when appending to an existing program (it should be noted here that the example Debug display figures are doctored so that both pointers and text line are shown on each display page — Register HL' points to 40A4H and DE' to 40F9H)

With the target line displayed, all is ready for loading the machine code. Using 'M' — modify memory — starting at the byte following the semi-colon delimiter (3BH), enter each byte of the object code (Fig. 3 shows the target line with the nonsensical code intered): return to BASIC Ready using 'G'. The BASIC line can now be saved to disk along with any other lines resident, if any.

Using this technique, a subroutine file may be built and, using the method that follows be appended to any BASIC file resident in memory.

Appending the subroutine file, or any non-ASCII file, is simplistic though exacting.

First, load the main application program and enter Debug using CMD'D. Display location 40A4H and note the value of this and the following byte: follow the same proceedure for location 40F9H. A reminder, the first address points to the start of BASIC text. The second points to the start of the scalar variables which is, effectively, the end of BASIC text. Now that the location of the text is known, modifications can be made to 'top load' additioal text from disk.

Using Debug command 'M', modify 40A4H - 40A5H to the contents (minus two) of 40F9H - 40FAH respectively: re-enter Basic by typing 'G': load the appendage file from disk, re-enter Debug and restore bytes 40A4H - 40A5H to

their original values and return to BASIC. (BASIC will automatically update 40F9H - 40FAH to reflect the new end of text).

With this done, the text In memory now consists of the original text plus the appendage! Delete any lines of subroutines that are not required for the application.

It remains now to define the subroutines(s) in the main program in such a manner that automatic relocation can be achieved despite any addition to, or deletion from, main text. This can be done as shown in the following example:

```
10 DEFFNP%(P!)=-((P!32767)*(P!-65536))
-((P!32768)*P!)

20 DEFUSRO=FNP%(PEEK(4049H)+PEEK
(404AH)*256-n)
```

where n is the number of bytes of code (that number which is recorded prior to the semicolon delimiter in the REM line) plus three. If other subroutine lines exist in text following that being defined, n should be increased by the number of noted bytes in each line plus an overhead of 8 bytes for each line plus the number of digits that define the routine length of each line.

In summary, my preference toward this method is that any routine so implemented is automatically loaded along with the application program, is protected and does not require any initialisation time. Additionally, it is possible to delete the routine(s) if of no further use during run time (if routine(s) are deleted at run time, any other USR routine(s) that remain in residence, that have been implemented using this scheme must be re-defined).

FIG. 1 Prepared Program Line: ready for 16 bytes of machine code.

```
AF = 44 42 -Z----N-
BC = 5B 01 => 00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
DE =
HL = 40 B7 => 5B FF FF FF FF FF FF FF  FF 00 00 00 00 00 00 00
AF'= 00 44 -Z----P--
BC'= 4D 69 => 46 55 4E 43 54 49 4F 4E  20 43 41 4C 4C 00 4F 56
DE'= 40 F9 => D7 68 D7 68 D7 68 B9 68  04 04 04 04 04 04 04 04
HL'= 40 A4 => BA 68 00 AD 5B 1A FF FF  FF FF FF 03 00 F1 FD B5
IX = EE FF => FF FF 00 B9 08 DE FF 00  08 31 00 01 00 F7 C0 00
IY = FF FF => FF.F3.AF C3 74 06 C3 00  40 C3 00 40 E1 E9 C3 9F
SP = FA 03 => AE 5B 1E 1D 00 00 00 01  00 F7 C0 00 00 00 FF 00
PC = 57 08 => E1 C9 3A 29 5B F6 C0 CD  09 44 E1 C9 D7 E5 3E 11
     68BA => D5 68 0A 00 3A 93 FB 31  36 3B 20 20 20 20 20 20
     68CA => 20 20 20 20 20 20 20 20  20 20 00 00 00 FF 00 00
     68DA => 00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
K    68EA => 00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
```

FIG. 2 Debug display showing line at 68BA ready for code insertion

```
AF = 44 42 -Z----N-
BC = 5B 01 => 00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
DE = 5B AD => 64 00 00 00 64 00 20 44  65 62 75 67 20 64 69 73
HL = 40 B7 => 5B FF FF FF FF FF FF FF  FF 00 00 00 00 00 00 00
AF'= 00 44 -Z----P--
BC'= 4D 69 => 46 55 4E 43 54 49 4F 4E  20 43 41 4C 4C 00 4F 56
DE'= 40 F9 => D7 68 D7 68 D7 68 B9 68  04 04 04 04 04 04 04 04
HL'= 40 A4 => BA 68 00 AD 5B 1A FF FF  FF FF FF 03 00 F1 FD B5
IX = EE FF => FF FF 00 B9 08 DE FF 00  08 31 00 01 00 F7 C0 00
IY = FF FF => FF F3 AF C3 74 06 C3 00  40 C3 00 40 E1 E9 C3 9F
SP = FA 03 => AE 5B 1E 1D 00 00 00 01  00 F7 C0 00 00 00 FF 00
PC = 57 08 => E1 C9 3A 29 5B F6 C0 CD  09 44 E1 C9 D7 E5 3E 11
     68BA => D5 68 0A 00 3A 93 FB 31  36 3B 4F B7 18 20 C9 D4
     68CA => 23 17 1E 38 CD 00 60 4E  4A.C9.00 00 00 FF 00 00
     68DA => 00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
     68EA => 00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
```

FIG. 3 Debug Display showing line at 68BA with code inserted.

```
10 '16;0AUTO INKEY$>#0+
```

FIG. 4 example of the nonsensical way that line will list
(N. B. These lines will abort Renumber utility)

Give That Program a Cramp

By G Lawrence

CRAMP is a program compacter for the System 80.

Besides the obvious benefit of saving memory there are several reasons why one may wish to reduce the amount of program text. Loading and saving of programs will be quicker, the program will require less space on the recording medium and finally, since BASIC is an interpretive language, execution speed will be improved.

To reduce the size of the program text there are several possible approaches:

- Remove all REM statements (including ').
- Remove all superfluous spaces and line feeds.
- Reduce size of variable names.
- Fit more statements on single lines.
- Generally improve code efficiency.

All these measures can be undertaken by hand but the first three, at least, easily lend themselves to an automatic process. Hence the following little machine code routine called CRAMP, for CRAM Programs (indeed a painful acronym!).

Before going further let me stress that if a programmer habitually writes his code in a cramped form, there is no way he is writing good software.

He may claim his programs are more efficient, and while this may be so, this benefit is far outweighed by costs in readability, portability and maintainability. Furthermore, by writing in such a fashion he will be making his task of development and debugging a great deal harder.

Therein lies the true virtue of this routine. It frees the programmer from anxieties about writing open, easily readable, well documented program text.

By appropriate use of the following routine it should be easy to keep full-length documented 'source' programs that can be maintained and modified with ease plus smaller 'executable' programs, which run faster and load more easily. These can be obtained by simply compacting the sources.

Since this routine allows selective cramping of the text it is possible to save memory during development by cramping program modules as they are individually tested and debugged.

THE PROGRAM: CRAMP is a machine code program for use on a System 80, but should also work with the level 2 TRS-80. It is fully relocatable and because of its small size it can quite safely be run from the I/0 buffer in reserved RAM.

If you elect to run the routine from the I/0 buffer please note that to prevent corruptions it should be run immediately after loading. Hence you must re-load it each time you wish to use it. This is not necessary if you load the program

into the normal machine code area in high memory, but of course this will require valuable user memory. If you do not have access to an assembler and/or elect to use the version loaded from BASIC then the latter option is the only viable one.

OPERATION: If you are using the BASIC loader then this program should be run at the start of the session. You must have reserved at least 104 bytes at the top of memory. CRAMP will be loaded from the location specified when reserving memory, note that this location is the entry point to the routine.

To specify the sections of BASIC code that you wish to compact simply enclose them with lines which have a '$' sign as the first character. These signs will be deleted by the routine. You may, of course, place a '$' sign on an otherwise empty line, in this case the whole line will be deleted.

If you wish to cram right to the end of the program then there is no need to put final '$' sign as the process will terminate then anyway. Therefore if you wish to compact the entire program simply place you '$' on the first line, if line 0 is not used then '0$' is all you need to type in.

Now enter SYSTEM mode. Those users who have punched themselves a SYSTEM tape should need no further instructions on how to load and run the program. If on the other hand you have used the BASIC loader then CRAMP is residing somewhere in high memory.

Simply enter a '/' followed by the decimal entry point of the routine. This value corresponds with that which you gave at power up. CRAMP will then go about its business and before you know you will have been returned to BASIC. If you now care to list your program you will see that, for the sections you have specified, all spaces not in quotes or data statements have been removed, same for line feeds if you use them.

All REMs and 's will have disappeared. Note that if the REM was the only statement on the line then the line stub will be retained in case it is used as a target for any GOTOs etc. Finally all alphabetic variable names will have been shortened to two characters. Variable names which contain numerals, however, may not be as effectively shortened.

Here comes the best part, ask for a print of MEM and see how much space has been created. Most programs can be compacted to between 80 and 90 of their original size by this routine, and what's more, despite what looks like a horrible mess, it will still execute as before.

MORE TO COME
NEXT ISSUE

```
                00100 ;  "CRAMP"  PROGRAM COMPACTER
                00110 ;
                00120 ;       (C) GLENN LAWRENCE
                00130 ;  PO BOX 191, HEIDELBERG 3084
                00140 ;
                00150 ;           FEB 82
                00160 ;
                00170 ;
                00180 ; --- LEVEL 2 ROM ADDRESSES USED ---
                00190 ;
1D79            00200 SKIPB   EQU   1D79H   ; SKIP BLANKS & GET CHAR.
2C77            00210 BASENT  EQU   2C77H   ; BASIC RE-ENTRY POINT.
                00220 ;
                00230 ;
41F0            00240         ORG   41F0H           ; I/O BUFFER.
                00250 ;
                00260 ;
                00270 ; ----- INITIALISE... -----
                00280 ;
41F0 2A4440     00290 CRAMP   LD    HL,(4044H)      ; LOC. OF START
41F3 54         00300         LD    D,H             ;   OF PROGRAM
41F4 5B         00310         LD    E,L             ;     INTO HL & DE.
                00320 ;
41F5 AF         00330         XOR   A               ; RESET THE "ACTIVE"
41F6 F5         00340         PUSH  AF              ;   FLAG. NC=FALSE.
                00350 ;
                00360 ; ----- LINE LOOP... -----
                00370 ;
41F7 B6         00380 LLOOP   OR    (HL)            ; IF WE HAVE
41F8 EDA0       00390         LDI                   ;   REACHED THE
41FA B6         00400         OR    (HL)            ;     END OF THE
41FB EDA0       00410         LDI                   ;       PROGRAM ...
                00420 ;
41FD EB         00430         EX    DE,HL
41FE CA772C     00440         JP    Z,BASENT        ; RETURN TO BASIC.
4201 EB         00450         EX    DE,HL
                00460 ;
4202 EDA0       00470         LDI                   ; MOVE THE
4204 EDA0       00480         LDI                   ;   LINE NUMBER.
                00490 ;
4206 7E         00500         LD    A,(HL)          ; IF 1ST CHAR
4207 FE24       00510         CP    '$'             ;   ON LINE
4209 200C       00520         JR    NZ,NOTOGL       ;     IS A $ ...
                00530 ;
420B F1         00540         POP   AF              ; TOGGLE THE "ACTIVE"
420C 3F         00550         CCF                   ;   FLAG. CARRY=ACTIVE.
420D F5         00560         PUSH  AF
420E 23         00570         INC   HL              ; IGNORE $.
                00580 ;
420F BE         00590         CP    (HL)            ; IF LINE NOW EMPTY ...
4210 2005       00600         JR    NZ,NOTOGL
                00610 ;
4212 0605       00620         LD    B,5             ; THEN DELETE IT ...
4214 1B         00630 DELETE  DEC   DE
4215 10FD       00640         DJNZ  DELETE
                00650 ;
4217 F1         00660 NOTOGL  POP   AF              ; IF NOT
4218 F5         00670         PUSH  AF              ;   ACTIVE
4219 3032       00680         JR    NC,MOVELN       ;     MOVE ALL THE LINE.
                00690 ;
                00700 ;                             ; ELSE ...
                00710 ;
421B 01FFD3     00720         LD    BC,3FFH         ; RESET CHAR COUNTER (C)
                00730 ;                             ;   & ALPHA COUNTER (B).
                00740 ;
                00750 ; --- CHAR LOOP... ---
421E CD791D     00760 CLOOP   CALL  SKIPB           ; SKIP BLANKS,
                00770 ;
                00780 ; --- TEST FOR VBLE NAME... ---
4221 7E         00790 VBLTST  LD    A,(HL)          ; GET NEXT CHAR,
4222 FE5B       00800         CP    'Z'+1
4224 300A       00810         JR    NC,NOALFA       ; IS IT
4226 FE41       00820         CP    'A'             ;   ALPHABETIC.
4228 3806       00830         JR    C,NOALFA
                00840 ;
422A 1006       00850         DJNZ  MOVECH          ; IF MORE THAN TWO
422C D4         00860         INC   B               ;   CONSECUTIVE LETTERS
422D 23         00870         INC   HL              ;     IGNORE REMAINDER
422E 18F1       00880         JR    VBLTST          ;       OF NAME.
                00890 ;
4230 0603       00900 NOALFA  LD    B,3             ; RESET ALPHA COUNTER.
                00910 ;
                00920 ; -- MOVE THE CHAR... --
4232 EDA0       00930 MOVECH  LDI                   ; MOVE IT & DEC C.
4234 B7         00940         OR    A               ; END OF LINE?
4235 28C0       00950         JR    Z,LLOOP         ; IF SO JUMP.
                00960 ;
4237 FE93       00970 REMTEST CP    93H             ; REM ?
4239 200A       00980         JR    NZ,QTEST
                00990 ;
                01000 ; --- HANDLE REM... ---
                01010         DEC   DE              ; DISCARD THE REM.
                01020 ;
423C 0C         01030         INC   C               ; IF ANY CHARACTER
423B 0C         01040         INC   C               ;   (IE. COLON)
423E 2801       01050         JR    Z,SKIPLN        ;     IS PRECEDING ...
                01060 ;
4240 1B         01070         DEC   DE              ; DISCARD THE COLON.
                01080 ;
4241 AF         01090 SKIPLN  XOR   A               ; IGNORE
4242 EDB1       01100         CPIR                  ;   REST OF
4244 2B         01110         DEC   HL              ;     THIS LINE.
                01120 ;
4245 FE22       01130 QTEST   CP    22H             ; QUOTES?
4247 2804       01140         JR    Z,MOVELN
                01150 ;
4249 D688       01160         SUB   88H             ; DATA?
424B 20D1       01170         JR    NZ,CLOOP
                01180 ;
                01190 ; -- MOVE THE LINE... --
424D BE         01200 MOVELN  CP    (HL)            ; MOVE REST OF LINE
424E EDA0       01210         LDI                   ;   UNTIL CHAR IN
4250 28CC       01220         JR    Z,CLOOP         ;     REG A IS REACHED,
4252 34         01230         INC   (HL)            ; OR
4253 35         01240         DEC   (HL)            ;   UNTIL 0
4254 28C0       01250         JR    Z,CLOOP         ;     IS REACHED.
4256 18F5       01260         JR    MOVELN
                01270 ;
                01280 ;
                01290 ;
41F0            01300         END   CRAMP
00000 TOTAL ERRORS
```

```
100 REM: CRAMP LOADER ROUTINE.
110 REM
500 REM: CALCULATE ENTRY POINT (ORIGIN)...
510 ENTRY=PEEK(16562)*256+PEEK(16561)+2
520 ADR=ENTRY
590 REM
600 REM: LOAD THE PROGRAM...
610 READ BYTE
620 IF BYTE=999 GOTO 700
640 IF ADR)32767 ADR=ADR-65536
650 POKE ADR,BYTE
660 IF PEEK(ADR)<>BYTE PRINT "BAD MEMORY AT";ADR :STOP
670 ADR=ADR+1
680 GOTO 610
690 REM
700 PRINT "CRAMP IS LOADED,"
750 PRINT "ENTRY POINT IS";ENTRY
800 STOP
900 REM
950 REM: CRAMP OBJECT CODE...
990 REM
1000 DATA 42,164,64,84,93,175,245,182,237,160,182,237,160,235,202,119,44
1001 DATA 235,237,160,237,160,126,254,36,32,12,241,63,245,35,190,32,5,6
1002 DATA 5,27,16,253,241,245,48,50,1,255,3,205,121,29,126,254,91,48,10
1003 DATA 254,65,56,6,16,6,4,35,24,241,6,3,237,160,183,40,192,254,147,32
1004 DATA 10,27,12,12,40,1,27,175,237,177,43,254,34,40,4,214,136,32,209
1005 DATA 190,237,160,40,204,52,53,40,200,24,245,999
```

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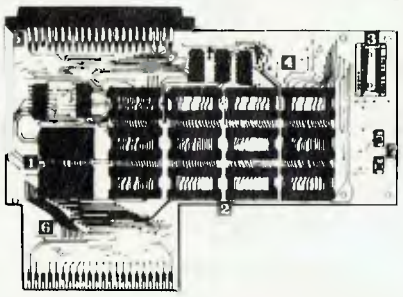

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your computer club news

APPLE Users Group (Sydney) is the new name for the NSW Apple Users Group, and the new contact is secretary Colin Rutherford, on (02) 520 0926. Postal address is PO Box 505, Bankstown 2200.

The AUG meets at the Sydney Grammar School Science Auditorium on the second Monday of every month at 6.30 pm. The group maintains an expanding library on disk and publishes a monthly newsletter called Applecations.

* * *

COMPUTER enthusiasts are active in the Blue Mountains area of NSW. The Blue Mountains Computer Club meets on the first Friday of every month at Springwood Civic Centre. People to contact for details are Eric Lindsay, (047) 51 1044 BH; or Greg Paulman, (02) 648 5342 BH, (047)51 3221 after 7.30 pm.

ATTENTION System 80 and TRS-80 sandgropers! The Perth 80 Users Group meets at the Community Recreation Hall, Macdonald St, Yokine, at 7.30 pm on the first Tuesday of each month. For information contact C Powell on (09) 457-6849.

* * *

THE Sorcerer Users Group of South Australia has a new meeting place. It's the first floor, Commodities Exchange Building, 123 Pirie St, Adelaide. The club meets on the second Wednesday of every month. The man to contact is Jeremy Webber, 22 Delange Ave, Banksia Park, SA 5091.

* * *

APPLE users in the Australian Capital Territory, the Apple User Group (ACT) meets on the second Thursday of each month. Contact is Jeff Brock, Buckley Circuit, Kambah 2902. Phone (062) 31-3630.

TRS-80 and System 80 users in and around the nation's capital will be interested in the ACT Micro 80 Users Group. Contact is Bill Cushing, 10 Urambi Village, Kambah 2902. Phone (062) 31 6399.

* * *

SOUTH Australian enthusiasts, B J O'Sullivan and Terry Wardle are trying to form a South Oz Compucolour/ntercolor Users Group. Contact B J O'Sullivan, PO Box 86, Torrensville, SA 5031. Phone (08) 352 3296.

* * *

SINCLAIR users can contact the National Sinclair Users Group through PO Box 148, Glen Waverley, Victoria 3150. If you send a 24 cent stamp to the club, you'll be sent an introductory newsletter, says editor D Karliner.

ACT

Australian ZX80 Users' Group (AZUG); David Bredenall, 19 Godfrey St, Campbell 2601.

MICSIG; Secretary, PO Box E237, Canberra 2601.

OMEGA (Ohio Scientific Microcomputer Enthusiasts Group Australia); Geoff Cohen, 72 Spofforth St, Holt 2615.

Sorcerer Computer Users of Australia (ACT Branch); Mr G T Dick, 31 Creswell St, Campbell 2601.

Apple User Group (ACT); Jeff Brock, 1 Buckley Circuit, Kambah 2902. Phone (062) 31 3630.

ACT Micro 80 Users Group; Bill Cushing, 10 Urambi Village, Kambah 2920. Phone 062) 31 3699.

NSW

Apple Users Group (Sydney); PO Box 505, Bankstown 2200. Phone Colin Rutherford, (02) 520 0926.

Australasian ZX80 Users Newsletter; 87 Murphys Avenue, Keiraville 2500.

Commodore Users Group; John Guidice, GPO Box 4721, Sydney 2001.

Compucolor Users Group; David Brown, 91 Regent St, Chippendale, 2008.

80-AT, The Australian 8080-Z80 Users Group; PO Box 165, Lakemba 2195.

Macarthur Computer Users Association; R G Friend, C/- 109 Campbellfield Ave, Campbelltown 2560. Phone (046) 25 2752 (ah) or (046) 76 0541 extn 325 (work).

MEGS, (Microcomputer Enthusiasts Group); John Whitlock. PO Box 3, St Leonards 2065.

Newcastle Microcomputer Club; Gordon Johnson, Electron Microscope Unit, University of Newcastle. Phone (049) 68 5045 (work).

NSW 6800 User Group; 27 Georgina Ave, Keiraville 2500.

Sorcerer Users Group; PO Box E162, St James 2001. Ian King, 15 Forest Ave, Wahroonga 2076. Phone (02) 48 6072.

TI-99/4 Home Computer Users Group of Sydney; S Anderson, PO Box 101, Kings Cross 2011. Phone (02) 358 6662.

Blue Mountains Computer Club; Eric Lindsay, (047) 51 1044; or T Macindoe, C/- PO Faulconbridge 2776.

Sorcerer Computer Users of Australia (NSW Branch); C/- PO Box 461, Ashfield 2131. Phone Howard Lardner (02) 357 6783 (ah).

Mi Computer Club; Polk House, 55 Herbert St, Artarmon 2064. Phone (02)439 6355.

Northern NSW MiCC Chapter; Alan Hartley, Dundurrabin via Dorrigo 2433. Phone (066) 57 8160.

QUEENSLAND

Brisbane Youth Computer Group; A Harrison, PO Box 396, Sunnybank 4109.

Commodore Computer Users Group of Queensland; Mrs D D Dillan, PO Box 127, Stones Corner 4120.

IREE Microcomputer Interest Group; N Wilson, PO Box 811, Albion 4010.

Superboard Users Group; Ed Richardson, 146 York St, Nundah 4012.

SOUTH AUSTRALIA

Adelaide Micro User Group, (TRS-80 and System 80 Users); R G Stevenson, 36 Sturt St, Adelaide 5000.

South Australian Apple Users Club; The Secretary, SAAUC, C/- The Bookshelf, 169 Pirie St, Adelaide 5000.

South Australian Microprocessor Group Inc, (SAMG); The Secretary, PO Box 113, Plymton 5038. Phone (08) 278 7288

Compucolor-Intecolor User of South Australia; PO Box 86, Torrensville 5031. Phone (08) 352 3296

South Australian Sorcerer Users Group; Trevor Bird. Phone (08) 266 1305.

Sorcerer Users Group of South Australia; Jeremy Webber, 22 Delange Ave, Banksia Park 5019.

VICTORIA

Apple Users Society of Melbourne; G Halprin. Phone (03) 859 5835.

BUG 80, (Burwood Users Group); PO Box 46, Blackburn South 3130.

Compucolor Users Group; L Ferguson, 12 Morphett Ave, Ascot 3342.

Geelong Computer Club; Peter McKeon, PO Box 93, Geelong 3220.

KAOS, (Ohio Scientific); David Anear, 49 Millewa Cres, Dallas 3047.

National ZX80 Users Club; 24 Peel St, Collingwood 3066.

Northern and Western Suburbs Computer Users Group; contact CP/M Data Systems, 284 Union Rd, Moonee Ponds 3039. Phone John King (Secretary) (03) 338 9304.

SMUG, SCORD M100 Users; Robin Miller, 60 Winmalee Drv, Glen Waverley 3150.

Sorcerer Computer Users (Australia); Secretary, PO Box 144, Doncaster 3108.

MICOM, Microcomputer Club of Melbourne; PO Box 60, Canterbury 3126.

National Sinclair Users Group; PO Box 148, Glen Waverley 3150.

WESTERN AUSTRALIA

Sorcerer Computer Users of Australia; The Secretary, 90 King George St, Perth South 6151. Phone (09 367 6351.

CU WEST (WA Compucolour/ntecolor User Group); John Newman, 8 Hillcrest Drv, Darlington 6070.

Perth 80 Users Group, System 80 and TRS-80 Users; C Powell. Phone (09) 457 6849.

NORTHERN TERRITORY

The Microcomputer Association of the Northern Territory; Andy Smith, Darwin Community College, Casuarina 5792.

Northern Territory 80 Computer User Group; R T O'Brien, 433 McMillans Rd, Jingili, Darwin 5792.

TASMANIA

TAS-Micro; Peter Deckert, Unit 1/456 West Tamar Rd, Riverside, Launceston 7250.

Tasmanian OSI User Group; David Tasker, 111 Bass Highway, Westbury 7303.

NEW ZEALAND

Wellington Microcomputer Society Inc; Lindsay Williams, 2 Pope St, Plimmerton, New Zealand.

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Continued from page 31

hand edge of the screen, the display will start to move left, following it. However, when WordStar's word wrap feature moves a word to the left of the following line, the display jumps; I blink and wonder what's happened, and then lose my train of thought.

This is a minor failing however, and dedicated Oz owners (a *very* dedicated breed) probably never gave it a thought after the first five minutes.

The display is actually 132 characters wide by 32 lines deep, of which only 52 by 24 are displayed. By holding down the control key and any of the cursor control keys, it is possible to scroll the display in any direction.

On the other hand WordStar, as supplied, is configured for an 80 x 24 screen, so that horizontal scrolling is frequently used. Although it's not often necessary, a WordStar right margin of more than 79 will result in a document that looks (on the screen) like a dog's breakfast.

For all that, the Osborne is usable, and quite easily so. On the first day I had it, I toted it along to a business meeting, set it up, and proceeded to astound everyone. The old days of getting executive kudos by putting your pocket calculator on top of the boardroom table are over!

BIOS Fudges

The video section of the Osborne emulates a Televideo 912 terminal; both the screen driver ROM and the video RAM are hidden away in memory pages, so it is able to run a 60K CP/M system which is reasonably standard as far as application programs are concerned.

The machine comes with 5 disks, each of which seems to have a different version of the CP/M BIOS on it. For example, the Supercalc disk, when booted, does not force the cursor to remain on the screen; this is probably because the Supercalc program is set up specifically for the O-1's 52 by 24 screen. The WordStar disk, on the other hand, has that feature implemented.

Another neat feature on the WordStar diskette is that the up, down, left and right arrow keys have been re-defined to call for control-E, -X, -S and -D respectively. This means that WordStar will understand the conventional arrow keys, something most other systems don't provide.

On most disks, a program called AUTOST.COM is run on cold boots, and usually initialises whatever it initialises, then chains to WordStar, MBASIC, Supercalc or whatever. On the system disk, for example, it runs a program called HELP.COM, which contains 26 helpful screens of information for the beginning user.

Occasionally the autostart feature could be a nuisance; for example, when you want to use CBASIC but the disk boots and runs MBASIC, from which you must exit before invoking the CBASIC compiler.

The most amazing thing about the Osborne is the price. The software alone supplied with the package adds up to almost $1600 at retail prices!

The Words

The documentation supplied with the Osborne is interesting. A major reason for the low cost of the machine is Osborne's licensing arrangements with software suppliers. For example, Osborne ob-

tained rights to reproduce unlimited quantities of Supercalc for only $20,000 — similar figures would probably apply to the rest of the software.

For this reason, and in an effort to prune costs, the documentation supplied with the Osborne is not the original software suppliers' manuals. Instead, the Osborne is supplied with a thick three-ring binder full of re-written notes on the various items of software.

This approach is interesting, for several reasons. The documentation has been extensively re-written, with separate tutorial and reference sections. The tutorial section, in particular, is well-organised to meet the needs of the novice user, with material being introduced at something just short of breakneck pace.

The difficulty of this approach is that inevitably some reference material has been omitted — for example, a lot of the WordStar printer driver patch area listing information has been left out. In ordinary use, with a common type of printer, the user will never encounter any problems; but my feeling is that when trouble strikes, the user needs all the information he can get. Of course, he is always free to order copies of the manufacturer's original documentation.

The CBASIC chapter of the manual seems to be loosely based on the Osborne/mcGraw Hill BASIC User Guide, while the MBASIC material seems to have been specially written. The WordStar notes, similarly, appear to be abstracted from the Osborne/mcGraw Hill WordStar book.

Overall, the manual's style is quite informative; frankly, I wish I'd had something like it when I was first trying to master CP/M, CBASIC and similar software.

The Software

The software supplied with the system is all good quality stuff. I swear by WordStar; I feel there's nothing to touch it and, I use it up to six hours a day.

The copy supplied with the O-1 is version 2 — although version 3 is available, Osborne said on a recent visit to Sydney, 'the major advantage of version 3 is its horizontal scrolling, and our machine has a better implementation of that anyway'.

MBASIC — whAt can I say. If anything represents an industry standard, this is it. Used in almost every computer from the TRS- 80 to Intel development systems, almost all the BASIC programs you see published are in Microsoft BASIC or a close facsimile thereof. Benchmark tests usually show MBASIC to be a pretty good performer, too.

CBASIC is the industry standard for business. Almost all business software was, until recently, written in CBASIC. It's a pseudo-compiled language, with a compiler-interpreter pair of programs, and can do some nifty tricks that MBASIC only recently acquired.

Supercalc is another of those programs that turns people into terminal junkies. The Osborne implementation runs quite nicely, offering slightly more information on the screen than Visicalc, but not as much as a full 80-column version of Supercalc. For all that it works, and works nicely.

All the usual utilities are supplied with CP/M, including quite a nice sorted directory utility. Osborne obviously regards CP/M as being something of a black art to the average Osborne buyer; he's probably right.

On the other hand, the manual contains a highly technical discourse on programming the IEEE-488 interface that is unlikely to be touched by any but the most sophisticated users, particularly since the sample programs given are in Z-80 code that the CP/M assembler won't accept.

With the supplied software, the Osborne makes quite a useful executive tool. I'd hate to use it for all-day word processing without an external monitor, but for occasional use, the built-in screen is just fine. Supercalc is pretty close to my ideal spreadsheet calculator, and the two BASICs between them cover all my BASIC programming requirements.

The only tool I'd like to see added to the Osborne standard package is some kind of database such as Whatsit — nothing too sophisticated, just a simple information manager. However, the Osborne's disk space could prove a slight limitation, at least until the double density upgrade is released (any day now).

All in all, I'd have to say the Osborne packs more power for the dollar than any other computer currently on the market. It's bound to make a killing. □

Specifications and Report Card

Unit:	Osborne O-1
Made By:	Osborne
Processor:	Z-80A
Clock Speed:	4 MHz
RAM:	64 Kbytes
ROM:	4 Kbytes
I/O:	1 serial port, 1 IEEE488
Languages:	MBASIC, C Basic standard, other usual CP/M tongues
Keyboard:	QWERTY, numeric pad
Display:	128 x 32 in RAM, 52 x 24 on screen
Graphics:	Graphics character set
Peripherals:	External video, printers
Best Points:	Price, portability, software
Worst Points:	Standard screen, disk capacity

Ratings:	**excellent**	**very good**	**good**	**poor**
Documentation:			✓	
Ease of Use:			✓	
Functionality		✓		
Support:		✓		
Value-for-money:	✓			

Extras Included:	**WordStar, Supercalc, MBASIC, CBASIC**
Price:	**$2200**
Review Unit from:	President Office Machines, Sydney

LINTON-SIMPKINS

BARRING someone getting sufficiently upset with my writing to put out a contract on me, I have a fairish chance of surviving into the 21st Century.

The problem is I don't think I am going to like life very much by that time, and I expect there will be others much like myself. Our lives will be changed drastically, and this will mainly come about through the use of electronic developments in general and microprocessors in particular.

Currently, our society's customs and mores are determined by the need to move large numbers of people physically from their sleeping places to their working sites each day.

This wasn't always so. At the time of the Industrial Revolution most people lived within a few hundred metres of where they worked.

It wasn't until the first practical trains were in operation that it was possible to think of building the dark satanic mills of the UK Black country. If you have a plant which employs 10,000 men, then they and their families occupy such a vast space around the factory that the outer circle dwellers cannot make it to the plant without some form of powered transport.

At the time people in the vast plants which made the fortunes of a tiny few were simply a biological servo mechanism. Human biological servos are, or were then, very cheap and there was an inexhaustible supply.

Later these biological servos began to prosper and lived further from the plant, so there was an upsurge in the demand for cars, bicycles and buses.

But even the vast hordes of people busting to get away from farm labouring and into those satanic mills wasn't sufficient to provide all the servo mechanism needed. There were two responses to this; the one involved the swing to powered tools and the other was simply a biological and involuntary one.

Oddly enough the farm labourers of Europe and the UK often suffered frightful food shortages in the midst of plenty. Tens of thousands of the UK farm workers died of malnutrition each year.

Puberty And Birthrates

But despite the frightful working conditions in the mills many people were getting their first cash pay ever and for the first time in man's history little girls began to get almost enough to eat. The girls' age of puberty began to fall and in 50 years it had come down five years. More people were being born as a result of this, so the population surged.

However, while the move to power tools brought improvements each year in the design and efficiency of these tools, humans have not improved their design significantly since the negro appeared. He is slightly higher on the evolutionary tree than the white man, but not enough to cause the machine any serious competition.

Probably since about 1909 the demand for people to work in factories has declined — that's if it is expressed as a number of people per unit of output. That was the year the first fully automatic factory, making truck chassis, was commissioned in the United States.

Now there is even a pilot automatic sheep shearing system operating in Australia. The days of the vast production lines, so hated by Charles Chaplin and so satirised by him in Modern Times, are almost over. Man's output has remained at a maximum of about a quarter of a horsepower, his reaction time is still only about half a second, he cannot see anything outside a very narrow band of the electromagnetic spectrum, he cannot hear many sounds and his price is constantly going up.

In contrast, the modern microprocessor-based factory servo systems are better each year and cheaper almost each month.

So much for production lines, they were soul-destroying things and humans were slaves to the machines controlling the lines. True, but what of the great mass of

people who were content to work in those conditions, the great mass of humans who couldn't handle anything else? It is simply not true that all men were created equal, although they are all endowed with certain inalienable rights.

Oh Yes, Telecom Lags

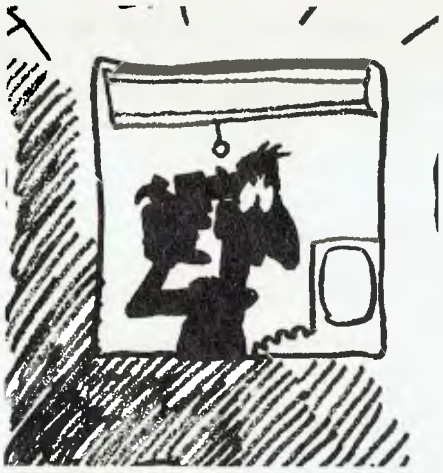
Now what is to happen when the people at Telecom finally realise that the facilities it provides for communication in Australia are inadequate and that we are years behind Canada?

Australians are already enophobic in the extreme. We don't even like one another. Australians are isolated from other peoples and even more so from one another. So will increased communications facilities improve the situation and Australians begin to actually talk to one another; that is, except by swearing out of the windows of cars at the people they have just failed to kill?

With the demise of the production line and an accompanying decline in the need for masses of humans to be transported across country, Australians will retire into houses which will increasingly resemble personal fortresses. Since there will be little call for manufacturing labour the work, what little there is left, will be clerical and administrative, and this will be performed from inside each personal fortress by using a terminal.

Of course some way will have to be found to drastically reduce the population to manageable proportions. This will partly be accomplished by letting the natural enmity between Australian men and women flourish. We have seen how easily this can be manipulated in the fight for pre-selection in the recent by-election for the Federal seat of Lowe.

The possibility of population increase won't be good once the full effects of the new communications revolution comes to a head — humans will work at their terminals, away from one another.



Few people will be able to find work of any kind. History has shown that whenever a new device has increased productivity, managements have never offered reduced working hours and kept the same number of people. Knowing the darker side of my fellow humans, I'd expect there will be still 40 or even 48 hour weeks but only a handful of workers.

Employment Is Status

If a man doesn't have a job he lacks status in the community. This will still be known, even if the mass of population doesn't leave home to work. This lack of status will also help to make the birthrate fall as the men won't have the confidence to leave their fortresses and meet women. Australian men are already terrified of their women; anything else which puts them down will result in a sharply falling birthrate — a highly desirable situation.

Each house will have to provide the entertainment the humans used to go out for. Cable television is a must and so is the delivery of food by some form of automatic delivery system to the ration levels of the household dwellers.

Initially it will be dwellers, plural, but very shortly there will be one human to a dwelling unit. Life expectancy will fall sharply and mental illness will become the major health problem of the community.

We Made It Possible

In such a community, compliance with laws and customs will have to be absolute and deviant behaviour will be controlled by personality altering drugs introduced via the food supply. It is possible that only one sport will be played: war, using individual battle units like one-man tanks.

It shouldn't take long for humans to develop a taboo against being in the presence of another human. The humans will have to use the communications channels to talk to each other, and this sort of thing can be computer monitored to listen for certain key anti-government words.

This isn't going to have to wait until the next century. The US government has been monitoring all television conversation in and out of the UK for at least ten years using a computer to check on suspect words, then referring the suspect conversation to a US intelligence man to listen to it personally. The UK government assists the US to do this.

I would expect the dwelling units would be stacked under-ground in the least acceptable locations in the country, since they wouldn't want the people to get out anyway.

I may link up with the Pintubu, they won't be able to bug the Oglas. So I am mildly paranoid! Paranoia isn't an illness any more and we who see the world in shades of grey are probably exhibiting a survival characteristic.

Just think, we of the computer community made it all possible!

Giving our sort of power to politicians is like giving an idiot child a loaded Thompson sub-machine gun, but we did it and it's partly our fault that we will all live the way I say.

Frank's People

EVERY year a Business Efficiency Fair is held in the Royal Agricultural Society's Sydney Showground, and every year regular fun and games go on.

All publications with some remote connection with the event run supplements, while some publications are informed that the organisers do not wish to provide any information to them. This happens with every such exhibition.

The other thing that happens every time is that most exhibitors will report massive sales at the exhibition and most of these sales are usually illusory.

Each firm runs demonstrations where its own staff appear as the 'interested' crowd, while most of the non-staff watchers will be competitors seeking knowledge.

Apart from competitors and one's own staff, the stands will be visited by hundreds of earnest knowledge seekers who haven't the authority to buy a packet of rubber bands between them and hundreds of students from the various CAEs and real universities, all without an order form to their name.

Meanwhile. the exhibitions are great places to look for a job with another equipment company or to pirate someone's staff.

Much poker is played and the bar is always a big winner.

At one of those exhibitions in Melbourne, one nasty type put a strong magnet into the tray where his competitor was storing magnetic stripe ledger cards! Another man had to roll his marketing manager in machine covers and store him behind a large machine every day about noon.

It's all part of life's rich tapestry. □

your APPLE computer

Peter Sandys

WE'VE SEEN a couple of new software packages recently that are particularly useful, and will help in improving the speed of your Apple.

The first is by James Donald, of Sandy's word processor fame. James is nicknamed Sandy, hence the name on his excellent word processor — I'm not related to him, nor the word processor, and to the observant my name does not have an apostrophe... It's called FDOS (short for FastDOS) and it *is* fast. It will load Integer BASIC into a RAM card in three seconds rather than the 13 seconds it takes under normal DOS. This is similiar to the time the Basics disk takes to do the same. This new disk operating system can be used to replace any existing 16 sector DOS, although it does not always work with protected programs and can, in fact, destroy those disks.

Below is a summary of the relative timing for disk access, as quoted in his manual. We've checked them, and the difference really is as spectacular as claimed:

	DOS	FDOS
Bloading Integer BASIC	13 seconds	3 seconds
Cataloging a 12-file disk	2 seconds	1 seconds
Saving a 10-sector disk	6 seconds	2 seconds
Saving a 100-sector program	34 seconds	7 seconds
Loading a 100-sector program	24 seconds	7 seconds

Programs I have successfully FDOSed include the BPI Accounting programs and VISITREND/VISIPLOT. However I suggest you use your back-up versions, not the originals.

Programs whose copy protection is tied into the DOS tracks are the ones you can't modify with FDOS. The ones I tried unsuccessfully included Superscibe II, Visifile, Sandy's word processor (he has a FastDOS version on the way, of course — in fact, he wrote FDOS as an improvement for the word processor), and Time Manager.

A Compiling TASC

The second utility program I tried is TASC, the Applesoft compiler from Microsoft.

I found it extremely useful in improving the speed of my programs and some commercial programs as well. The programs I compiled were much faster than BASIC — I didn't do strict timing comparisons but Microsoft suggests an improvement of two to 20 times is in order.

The biggest criticisms of TASC are the need to use a runtime BLOADed program prior to execution of the compiled version and the poor documentation.

If I was a great machine language programmer the documentation would possibly make more sense, but then I wouldn't need TASC!

If you have some very large and slow Basic programs, TASC is well worth investigating.

More Games, James...

I have just put my hands on two new games, although I haven't been able to review them yet — maybe next month. They are Shattered Alliance and The Road To Gettysburg, both from Strategic Simulations.

Shattered Alliance is currently available in Australia; The Road To Gettysburg isn't, but should be soon.

...In Living Colour

Digitek Pal colour cards, which provide far better colour quality than other cards I've seen, are now available. They should be available at most Apple dealers — if not, contact Imagineering or City Personal Computers in Sydney.

The display is equal to that of a monitor-converted television set. In fact Peter Hatcher of City Personal had trouble at the Applefest convincing dealers that he was using a rented television rather than a monitor. There is a catch: you will need a UHF TV which can pick up channel 33.

Digitek also makes a 16K RAM card which is good value at $195. It has fully socketed ICs and is self-contained; you don't have to remove the RAM chip from the main Apple board to strap it into the memory map.

Also on the hardware side, the cost of Apple disk drives has increased. I'm not sure what to blame — it could be actual cost increases at manufacture, the cost of importing them (the Australian dollar has dropped about 10 percent), or it may be because of the imitation Apples, which do not provide drives.

Flatterers To Be Flattened?

Apple has announced it has 'commenced its investigation and legal action against Asian imitators of its Apple II computer'.

The company said it was acting in response to the appearance of such products in the Far East.

"Our information at this time indicates that the manufacturers of these products are essentially garage-type operations," said Albert A Eisenstat, Apple vice-president and general counsel, on his recent return from a trip to the area.

The rest of Apple's message said it would pursue all avenues to prevent this and that the imitators appeared to be violating intellectual property rights including patents, copyrights, and trademarks. It will take action as soon as possible.

I feel Apple has supported its product well — more so than many other companies — and to buy an imitation is not respecting this support.

However, there are always those who want to save a buck at the expense of others, but this can backfire. I'd certainly be worried about the degree of support I'd get for an imitation if Apple is successful in its legal moves. □

Computers in Singapore

I HAVE just returned from a two week holiday in Singapore where I promised my wife that I would not get involved with anything boring like computers.

I faithfully adhered to my promise. Well, almost...

There was one exception — I just happened to stroll past a computer shop which had one of the latest magazines I wanted.

While she was bargaining elsewhere I returned for that moment of infidelity (in case you're worried, she will never read this magazine. I am safe).

I was even happy myself to avoid any thought of Computers, and was beginning to relax and forget about RAM, ROM and the rest.

However, I didn't count on the amazing enthusiasm of the Singaporeans in embracing the future of the world of microcomputers.

Every day there was some mention of micros in the press and on television. Not one of the eight days I was 'relaxing' passed without me noticing at least one reference to microcomputers.

What was all the interest in micros about, I wondered? Apart from Apple and

Hewlett-Packard (who have manufacturing concerns in Singapore) the government, schools (tertiary, secondary, and even primary), trade unions, military and business are all actively interested in developing the use of Micros.

Here is a summary of some of the interesting items I saw or read whilst there.

- The Singapore schools board has recommended that a Computer studies course in BASIC be allowed as a qualifying course for their equivalent to our Higher School Certificate.
- The Heng A Khe Bong Primary School was reported to be the first primary school to own a computer (Commodore). It is at present limited to use by the science (yes, science at primary school) students. They use it for screen editing and simple mathematical problems. The most interesting part is the school expects that by the end of the year all Year 6 students will be taught the basics of computer education. Also, most of the students said they wanted to study computer science at secondary school.

So much for the young. The most interesting items I saw included:

- 17 MPs from the Singapore parliament attended a 1.5 day computer appreciation course. The consensus was that the course was too short; they wanted to know more. To quote Mr Phua Bah Lee from a Straits Times Article: "the course clears up some misconception that the layman has of computers....at least now I should be able to understand and talk to my children. They know more about computers than I do. My interest has been stimulated enough for me to want to use the Apple II I have at home'.
- At the same time there was a Trade union conference at which leaders were given hands-on experience with microcomputers. Apple lent a number of machines for the union leaders to work with and develop an understanding of micros.

Other articles on micros were:

- $1 million school to train electronics engineers. Honeywell is to train electronics engineers in the installation, operation and maintenance of microprocessors.
- Local construction industry conference to have a demonstration of micros for use in the construction industry.
- Vocational and industry training board offers scholarships to staff to help them upgrade their skills in various areas, one being microcomputers.
- Professor urges real estate agencies to switch to computers.

These articles were taken from the local paper on one day out of the eight I was there.

The average Singaporean earns $A450 a month, so labour costs are minimal compared to ours but they recognise the need to become computer literate and, even more importantly, they have recognised the need to become literate with micros.

Maybe its time we did something here before we are left behind. □

IN MY review (*Your Computer*, January) of the Z80 Instruction Handbook, I neglected to advise that it is available from McGill's at 187 Elizabeth Street, Melbourne, for $8.50.

As I said then, the book is a really vital addition to an assembly language programmer's library of reference books; and it will take away the mysterious aura that tends to put the hopeful assemblerists off delving into the 700-odd instruction codes. For further details see the January issue.

Underlining With Scripsit

Ian Robertson, member of the Adelaide User's Group, has modified the Scripsit underline routine from the June issue of 80 Microcomputing to work with tape.

The utility of this facility will not be appreciated until you use it. Together with the pause facility it removes any chance of recognising the output from a Daisywheel printer as a computer output.

For those who've been put off by the somewhat complex (at least to me!) explanation of line lengths and buffers for the printer, I pass on my conclusion that it applies to the author's particular printer only. So don't let that limitation dissuade you from making the modification; I've simply disregarded the author's whole reference and all seems to work well.

It is true, however, that a flush-right line will be entirely underlined. All that's necessary is to manually align it flush right.

Beating Interference

Having tried many different plugging combinations of my filtered power supply (actually a Kambrook four-point power block with capacitors and toroids stuffed in the back), and surveying similar problems, I've found a big culprit is the cassette cables.

The glitches and spikes I get seem to largely come from the cassette through the computer cables, rather than through the power. This can be proved or otherwise on your system by simply unplugging your leads to the computer and manipulating the cassette controls to see if you get the same flashes on the screen, printer 'jerks' or whatever.

Of course this is not to discount the contribution made by outside elements: thermostats in the kitchen, fridge motor, washing machine, iron and all manner of electrical interference. Electric welders are a well-known culprit too.

It seems there's not much that can be done if indeed it is one of the aforementioned appliances; even using a separate power point on another circuit may not help as they all meet in the meter box.

What is worth trying is simply using an extension cord into the same power point in the hope that the interfering spike may become lost in the extra length of cord! Silly as it may seem, I've experienced some small success by this means.

Yes I do know the technical explanation is more scientific than this, but let's not complicate things with reasonable explanations (I'll let Mr Bell do that).

Lowercase Bugs

For some time I'd been trying to write a program to print the contents of the screen on the printer (yes, I know there are available ready-written routines, but there's nothing like doing it yourself, especially if you enjoy fiddling).

I put my failure down to rigid thinking not letting me believe my eyes: the hex code of the character I was getting from the screen memory location seemed to be totally wrong. When I found I could get the correct code by adding 40hex, I was more baffled, since all appeared well on the screen. Indeed, when I put the correct code into screen memory nothing changed.

After experimenting with a few other units, I've concluded that the Tandy-style lower-case modification installed in a keyboard with the earlier three-ROM set will produce a hex value of 40 less than it should be for the codes from 41H to 5FH.

The obvious answer can only be that the hardware takes care of things. But what a trap to lie in wait for the unwary!

System-80 Recording Problems

John Ross, the System 80 section-leader from the Adelaide Users' Group, has found the remedy for some System 80s being unable to record object code from Editor Assembler. But it is only some System 80s — if you've had no trouble, please dismiss this as mere waffle.

The fault lies in the 0.005 capacitor in series with the recording head. Dick Smith Electronics suggests this can be changed to 0.047 and R23 resistor to 4.7k.

While this will fix the immediate problem, previously recorded tapes may not load because the increased frequency response detects too much tape noise, and the volume control is too sensitive. However, if a 0.003 capacitor is soldered across the existing one and the resistor left alone there seems more success.

Unfortunately, this is not the reason why Scripsit will not work on the System 80. More correctly, it will work for text entry, but once in, the text won't come out to either printer or tape. The answer for the printer is its different address, but the lack of writing/reading tape is not so easy. More on this when it is solved.

Debugging Assembly

In an earlier column I touched on what I see as the difference between a monitor and a utility. I put Z-Bug into the monitor category because of its complexity of operation.

I'm now able to bring you news of a new Australian program which I've found is the best yet for debugging assembly. It is written by Edwin Paay of Intersoft and distributed by Micro 80 of Adelaide. It will be released soon with a new ROM Manual as an assembly programming and debugging package. When it is available I will be giving you a review of it. At around $30 it's well worth putting on the shopping list.

The reason it's so practical is that Edwin wrote it for his own needs — there was simply no screen-oriented debugging program available. Only after using it for many moons and talking to others did he think it might be worth marketing.

To my way of thinking it's better for a program to be written to work than to be written to be sold!

Assembly Beginners' Guide

I'm often asked what I'd recommend to a potential starter into the 'jungle' of assembly. Although I've recommended various materials in earlier columns, perhaps it's pertinent to repeat it all together here, in order of necessity:

- Bill Barden's book TRS-80 Assembly Language Programming from Tandy. Yes there are gaps, but it's a good foundation.
- Microsoft's Editor Assembler Plus. This comes with Z-Bug and an excellent manual for using an assembler.
- Scelbi's Z80 Instruction Handbook, referred to above.
- The Intersoft Debugging Package, also referred above. It contains a ROM manual as well as a program to allow you to single step and still observe the program, as well as modify registers and memory. This is harder with Z-Bug.

Read as many books on assembly as you can acquire. Reading differently ab-

out the same thing often makes it 'click'. Barden's column in 80 Microcomputing I find particularly valuable, although of late he seems to share with Dennis Kitz an obsession with the Tandy Colour Computer.

But perhaps what I should have listed first is to belong to a computer club if you possibly can, since it is absolutely the best way to learn. Just by associating with others you can't help but amass knowledge. And of course, your local club may even run assembly courses especially for the TRS-80 (as does the Adelaide group).

I can't let this opportunity pass without asserting yet again that assembly is not harder and not the next step after BASIC. The advantage BASIC has is that its commands and statements are in English, and therefore understandable.

Once you grasp the language and translate such mnemonics as SRL A to mean divide by two, things become much simpler. Just as it would be silly to attempt to study a foreign language without some form of translation dictionary, so it is with assembly; which is the reason for recommending Scelbi's publication.

While on recommendations: I use MON-3 as a general purpose tool to aid me in my fiddling, though I know people who are just as partial to RSM, TASMON and C. So I suppose it just depends on what you've been brought up on. The same applies to my other 'pets': RNMD for renumbering; TRCOPY for copying machine code tapes; PACKER for making efficient programs in BASIC; SCRIPSIT for word processing.

SYSTEM Command

Since my last attempted explanation of the difference between BASIC and machine code use of RAM, some users have mentioned that I left out an adequate explanation of the SYSTEM command. I am pleased to receive such criticisms; it allows me to follow up points I have neglected.

Most computers have what they call a monitor mode, as well as a normal operating mode — usually BASIC. However, Tandy didn't provide us with a 'real' monitor mode.

What we use as the SYSTEM mode to load machine code tapes was actually the place where a monitor would have been entered if it were present.

Of course there is a monitor; it's concerned with the operation of the system rather than the operation of the program. This is why we need to load MON-3 or something similar to fiddle with our program.

PEEK/POKE Department

I really can't see what is mysterious about PEEK and POKE. They are merely a means of accessing (reading or writing) a particular memory location from BASIC. And that's all there is to it!

Certainly an explanation of all the uses of PEEK/POKE would take a good sized article because of their great usefulness, but the basic concept is simple enough.□

DIGITAL RESEARCH has relaxed the licencing requirements for distributing code from its compilers.

In the past, programmers who wanted to sell code produced with CB-80 had to pay DR an annual licence fee of $US2000 for distribution rights. Similar provisions applied to PL/-80 and PASCAL MT+ although not to CBASIC.

Now these fees have been dropped entirely, so there is no need to pay for a licence to distribute produced code. Users who have paid the distribution licence fees will have that payment credited towards the purchase of other products from DR; contact the company for details.

Intel And DR Co-operate

Intel and Digital Research are co--operating on the development of MP/M for the new Intel IAPX-286 microprocessor.

The IAPX-286 is the next level of development of the 8086 (or IAPX-186). Intel is providing development hardware and technical support for the MP/M-286 software development.

Gary Kildall started developing CP/M with the idea of it being the operating system for Intel's microprocessors but Intel wasn't interested; he went ahead and developed it himself, launching DR. Little did Intel realise what it missed out on!

Grey Envelopes

Digital Research likes to send out its mail in distinctive grey envelopes and when one of these turns up in my mail box I tend to open it with some fear and trepidation about the contents.

Will it be a bug fix (that's okay) or new product announcement (that's okay too) or will it be a $25, $40 or more update to fix the bugs in one of its products (that's not okay — the bugs shouldn't have been there in the first place).

Its been quite a while since I've received a grey envelope, and in the meantime I have actually received two *free* updates to CB-80. Then, recently, a big grey envelope arrived!

Well folks, it seems Digital Research has recognised the existence of this column as a regular feature of *Your Computer* and sent me a complete set of current application notes for CP/M and its included utilities from the new Technical Support Group.

While I'm pleased that we have received this important information it dismayed me somewhat to see that the dates on some of the application notes went back to early 1981.

I'd certainly never heard of their existence and on checking with a few of the local DR OEMs found they knew nothing about the existence of the application notes either. Anyway, we have them now and perhaps the Technical Support Group was formed to overcome this 'information gap'.

Some of the information is vital while other parts are of somewhat academic interest only or have been in the public domain for some time and have already been published in this column. Starting with this column I'll be presenting the more significant application notes. If you want to see the lot in a hurry write to:

CP/M 2.2 Application Notes,
Technical Support,
Digital Research,
P.O. Box 579,
Pacific Grove,
CA, 93950,
U.S.A.

Requests must be in writing and must include the user's CP/M licence number.

The PIP Patches

The following patches are extracted from Digital Research CP/M V2.2 Application Notes 5, 6, 7 and 8 and are reprinted with permission of Digital Research.

Program PIP.COM — Error Descriptions

1. A problem occurs with the PIP Start and Quit options when the Start and Quit strings are the same length.

2. A problem occurs with PIP object file transfer options when copying from file to file.

3. When using SUBMIT and XSUB utilities to execute multiple PIP commands from a submit file, it is not possible to exit from PIP automatically. This is because the SUBMIT utility does not accept lines with only a carriage return.

This patch modifies PIP so that a full stop can be used to exit from PIP instead of a carriage return. In the submit file, place a single full stop ('.') on a line by itself after the last PIP command to be executed.

4. When using PIP to copy to the PRN: logical device, the LPT: physical device is automatically selected. This patch disables the selection of the LPT: device and allows the PRN: logical device to be used without affecting the current IOBYTE setting.

Patch Procedure

Make a backup copy of PIP before making any changes. Changes are made using DDT or SID by the following sequence of commands:

```
DDT PIP.COM
DDT VERS 2.2
NEXT PC
1E00 0100
—L1168 ;patch 5
   1168 LDA 1F62
   116B STA 1DF7
   116E LXI H,1F62
   1171 MVI M,00
   1173 LDA 1DF9
   1176 INR A
   1177 STA 1DF8
   117A JMP 11A9
   117D MVI A,00
   117F LXI H,1F60
   1182 CMP M
—A1168
1168 LXI H,1F62
116B MOV A,M
116C STA 1DF7
116F MVI M,0
1171 LXI H,1DF9
1174 MOV A,M
1175 MVI M,0
1176 INR A
1178 DCX H
1179 MOV M,A
117A .
—L0713 ;patch 6
   0713 LDA 1F5E
   0716 LXI H,1E04
   0719 ORA M
—A713
0713 LDA 1E04
0716 LXI H,1F5E
0719 .
—L1099
   1099 LDA 1E04
   109C RAR
   109D JNC 10B2
—A1099
1099 LDA 1F5E
109C .
—L1640
   1640 LDA 1E04
   1643 RAR
   1644 JNC 1652
—A1640
1640 LDA 1F5E
1643 .
—L54F;patch 7
   054F CPI 00
   0551 JNZ 055E
   0554 LHLD 1DFC
—A54F
054F CPI 2
0551 JNC 55E
```

```
0554 .
—L0C66 ;patch 8
  0C66 LXI H,0003
  0C69 MVI M,80
  0C6B JMP 0C71
—AC69
0C69 NOP
0C6A NOP
0C6B
—G0
```

SAVE 29 PIP.COM

Copyrights And Trademarks

Digital Research would like to have us tell you "Licenced users are granted the right to include these changes in CP/M 2.2 software" and also that "CP/M is a registered Trademark of Digital Research".

Well that's fine, but this column is not going to get involved in putting little trademark symbols and notices all over the place; there are much more important issues to deal with.

We all *know* CP/M is a trademark of Digital Research and I'm sure you don't need to be reminded of it every time you see the magic CP/M initials. I'll remind you about the legalities of the situation once a year so DR can continue to smile sweetly at your columnist, and leave it at that.

Remote CP/M Bulletin Board

Thanks to all the people who expressed interest in the CP/M Bulletin Board.

The project is going ahead: a suitable dedicated computer has been obtained for the operation and the final details are being tidied up with Telecom. This is a new project for me — I don't want to get swamped with users in the initial stages, therefore if you want details about how to get onto and use the system you'll have to write. The service is free.

Send a large (for A4 size paper) stamped, self-addressed envelope to:

CP/M Bulletin Board,
P.O. Box 80,
Newport Beach,
NSW, 2106

Please don't send any other mail to this address and be warned that any mail not including a suitable SSAE will go straight into the rubbish bin.

You'll need a basic ASCII communications utility to connect to the system but nothing too fancy. Good, free public domain utilities will be available on line for downloading. □

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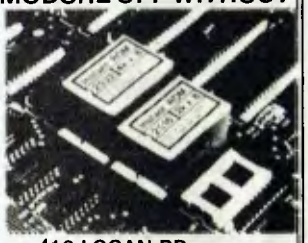

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your OHIO SCIENTIFIC computer

Geoff Cohen

I HAVE received details from several Australian software houses who are concentrating on Ohio Scientific software. Space permitting, I will give details of one or two of these each month.

If you have some good Ohio Scientific software you would like reviewed then send it to me, either through this magazine, or OMEGA (see the club news for addresses).

I'll start with a short review of CompDOS 1.2, an extension to OS65D produced by Compsoft in Melbourne (235 Swan Street; Phone 428-5269).

CompDOS 1.2 adds several commands to the standard V3.2 DOS, including CREATE, DELETE, RENAME, DIRECTORY, a clear screen routine and a random access buffer command.

All these commands are available in either BASIC, DOS or the assembler so it's no longer necessary to run the standard versions of CREATE, DELETE and so on. As an example, to save a BASIC program that doesn't have a directory entry just type:

```
DISK!'PUT FILENAME'
```

This is quite a deal easier than the old way, where you have to first save the program on a scratch file, then run CREATE, then transfer the scratch file to your named file. While it makes it easier for BASIC files, the improvement is really dramatic for Assembler files.

Another useful feature appears when a program has expanded to more tracks than the directory has allocated for that name (the dreaded ERROR D syndrome). Instead of panicking to find somewhere to temporarily store your great (of course) program, merely type:

```
DISK!'DELETE FILENAME

DISK!'PUT FILENAME
```

This deletes the old incorrect length directory entry, and then creates a new entry of the correct size.

I discussed it with George at Compsoft, and he says he will also supply the source code of the CompDOS 1.2 patch, although naturally the cost is higher.

The prices at the time of going to press were $35 for the standard 13cm (5 inch) disk, plus $25 extra for the source code. The standard disk comes with three copies, set up for 24K, 32K or 48K; of course if you have the source code you can modify it for any size you require.

It is also available on 20cm (8in) disks, although I don't have the current price for this size.

The price of this package is set so low I hope no one will be tempted to beg, borrow or a steal a bootleg copy. Just remember, if you get it 'free' it only means the really good programmers will eventually not write software for your system, as they won't get a reasonable return for it, and you will lose in the long run.

Jobcost Does The Trick

Dataflex Services (36 Northam Avenue, Bardon, QLD, 4065; phone (07) 36-4197) has developed a job costing and estimation system which will operate on most OSI 20 cm (8-inch) disk systems, including C4P-DF, C8-PDF and C2/c3-OEM systems.

Jobcost will operate efficiently where a business needs to cost a manufactured or assembled product. As a guide there should be at least 100 components per product, and a base of 'Standard' products in which some of the assemblies or components are optional or replaceable.

For example, a self-employed manufacturer of dune buggies who uses a standard Volkswagen engine and chassis, but customises some parts for individual customer demand; or a builder who has several standard designs, but substitutes materials, or alters a design for individual customers...

It would seem that many firms could save hours of repetitive and boring labour, speed up the production of costing reports and also make re-costing in response to changing prices much quicker, easier, and also a great deal more accurate.

For more details on this system, contact Serge Petelin at Dataflex, who will send you a 75-page manual and a demonstration disk for $8.50.

Dealer Delights

I'm glad to report that TCG now has a very knowledgeable person to handle the OHIO SCIENTIFIC side of its business.

Bob Wood has been very helpful, and informs me that TCG will now air-freight any out-of-stock items, ensuring delivery times of about two weeks.

He is currently reviewing the pricing of most Ohio Scientific systems; one of the changes is that a C1P-MF is now only $1999, including tax. I hope to get the full price list when it is finalised, and will give you more details when they arrive.

Printer Interfaces

For those of you who are thinking of buying a printer, and don't mind soldering a printed circuit board, you can save around $140 by buying the parallel (Centronics) version without the serial interface.

I have designed a small board which will let you use this parallel printer on any OSI system with the standard serial port. There are absolutely no software or hardware changes, except for unplugging your ACIA, and then plugging in the parallel printer interface printed circuit board. The cost of the bare, drilled PCB is $7.60. If you want more details, or an assembled version, contact me either through this magazine or via OMEGA.

Although I haven't tried this on systems other than OSI, it should function on any computer that uses a 6850 ACIA for its serial port.

If anyone wants a copy of the circuit (for making up their own personal one only), I can supply it for $1 (to cover the cost of postage and copying).

Who knows, if there is enough interest we may even be able to persuade our Editor to get into the perils of (dare I say it) hardware *(Who's afraid of hardware?* **-Ed)**. □

your ZX81 computer

By David Brudenall

THIS IS the first of what should be (hopefully) a regular or semi-regular page for ZX81 (and 8K ROM ZX80) owners.

I'll be looking at available hardware and software for the ZX computers, concentrating on the ZX81 and 8K ROM ZX80 machines rather than the old ROM ZX80 because I feel the ZX80 is at an evolutionary dead-end.

So far the most important ZX add-on rather than the RAM pack is the ZX Printer. Just recently released in Australia at around $180, it is a very capable machine, being able to reproduce practically everything the ZX81 is able to put on its screen.

It uses aluminised paper just 10cm wide, and produces quite legible printouts. The printer connects to the computer via a stackable edge connector which allows a RAM pack to be plugged in as well. Of course, with the printer plugged in the computer needs more power so a new 1.2 Amp power supply is included with the printer.

As well as the printer and the power supply, you get a 20 metre roll of paper and a comprehensive instruction booklet, which also includes sample programs for use with the printer. Overall, the printer is an extremely useful device for any ZX81 owner.

One of the biggest problems concerning the 1K ZX81 owner is the machine's evident lack of memory, and how to at least partially overcome this disability until a RAM pack can be afforded. There are several space-saving tricks I have learnt while using a 1K 8K ROM ZX80, and briefly, here they are:

1) Instead of using IF INKEY$='8' THEN LET B=B+1 & IF INKEY$='5' THEN LET B=B-1 use: LET B=B+1(INKEY$='8')-(INKEY$'5').

2) Instead of using IF A=1 THEN PRINT 'GAME OVER' IF A=1 THEN STOP use: IF A THEN PRINT 'GAME OVER';X (where X is a variable not used elsewhere in your program.)

3) If you use 1 and/or 0 a lot in your programs it would be a good idea to have a little line saying LET X=1 or LET Y=0 and then substituting X and/or Y everywhere 1 and/or 0 occur throughout your program. To save even more memory use LET X=PI/PI. Because PI is a function keyword, it doesn't use nearly as much memory as numbers, which use too much.

4) Put as many PRINT ATs as you can on the same line. It makes editing a pain, but it saves memory because you're not using a new line number and PRINT for each PRINT AT. For example, instead of:

```
10 PRINT AT X,Y;"*"
20 PRINT AT A,B;'HELLO'
30 etc. etc.
```

you can use:

```
10 PRINT AT X,Y;"*";AT A,B;'HELLO' etc.
etc.
```

There are more memory saving techniques than the ones above and most of them are in our Introductory Newsletter (that's the Australian ZX80/81 Users' Association's intro newsletter, of course!). I'll write more about AZUA's activities in the next ZX81 page (God and Les Bell permitting, of course).

Now, about this program. It's for a ZX81 or 8K ROM ZX80 with a mere 1K RAM, and uses many of the space-saving techniques I've just told you about.

The idea is to creep up on the 'sniper' using the arrow keys 6, 7 and 8 (you can't go backwards), all the time avoiding the sniper's shots. Once you're either directly above or below the sniper use key 6 or 7 to 'jump onto' the sniper, thus safely disarming him.

Once you've either 'nullified' the sniper or you've been shot the game automatically re-starts. You can stop by pressing 'BREAK'. Have fun, and try not to get shot (you'll miss out on next month's *Your Computer* if you do!).

```
1K RAM, 8K ROM ZX80 OR ZX81

  10 LET A=2
  20 LET B=0
  30 LET C=3
  40 LET D=30
  50 LET E=B
  60 PRINT AT A,B;"±";AT C,D;"("
  70 PAUSE 30
  80 POKE 16437,255
  90 CLS
  95 LET M=RND
 100 LET C=C+(M>.5)-(M<=.5)
 110 IF C<E THEN LET C=E
 115 IF C>5 THEN LET C=5
 118 LET M=RND
 120 IF M>.5 THEN PRINT AT C,E;"
 130 LET A=A+(INKEY$="6")-(INKEY
$="7")
 140 IF INKEY$="8" THEN LET B=B+
1
 145 IF A<E THEN LET A=E
 146 IF A>5 THEN LET A=5
 150 IF A=C AND D=B THEN PRINT "
NULLIFIED"
 155 IF A=C AND D=B THEN GOTO 21
0
 160 IF A=C AND M>.5 THEN PRINT
AT A,B;"AAARGHH"
 200 IF NOT (A=C AND M>.5) THEN
GOTO 60
 210 PAUSE 200
 220 POKE 16437,255
 230 CLS
 240 RUN

INSTRUCTIONS:
MOVE TOWARDS "(" (SNIPER) USING
THE "8" KEY. DODGE FIRE USING
THE "6" AND "7" KEYS. ONCE YOU
ARE EITHER DIRECTLY ABOVE OR
BELOW SNIPER USE KEY 6 OR 7 TO
LAND RIGHT ON TOP OF SNIPER,
THUS "NULLIFYING" HIM.

IF YOU ARE USING A ZX81 IN SLOW
MODE REMOVE LINES 70 AND 80.
```

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DISK DRIVES: MPI 5.25", 5 msec TK-TK, 250,000 bits per second.
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or 3 — 'CRC' or other errors on known good disks, or 'ZAPPED' disks?
or 4 — Syntax errors in programme lines that look OK?
and others say that nothing is WRONG???
Then we can help by providing the following, unique service.
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(b) GOLD plated connection system is installed to replace the existent problem inducing solder plated 'EL CHEAPO' style contacts.
(c) Install our DATA ERROR ELIMINATOR for reliable disk operations.
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(e) Install a reset switch at a convenient position ON the keyboard to avoid the normally used pencil or screwdriver technique.
(f) A 6-MONTH FULL WARRANTY is given towards your system except disk drives and monitor.
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Almost doubles your normal processor speed thus HALVES execution time, ideal for programmes that let you WAIT and WAIT whilst 'doing the business'. Can be used with ANY operating system. $125.00 (kit).

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ALL PRODUCTS UNLESS OTHERWISE NOTED ARE DESIGNED AND MANUFACTURED BY C.P.U. APPLICATIONS.
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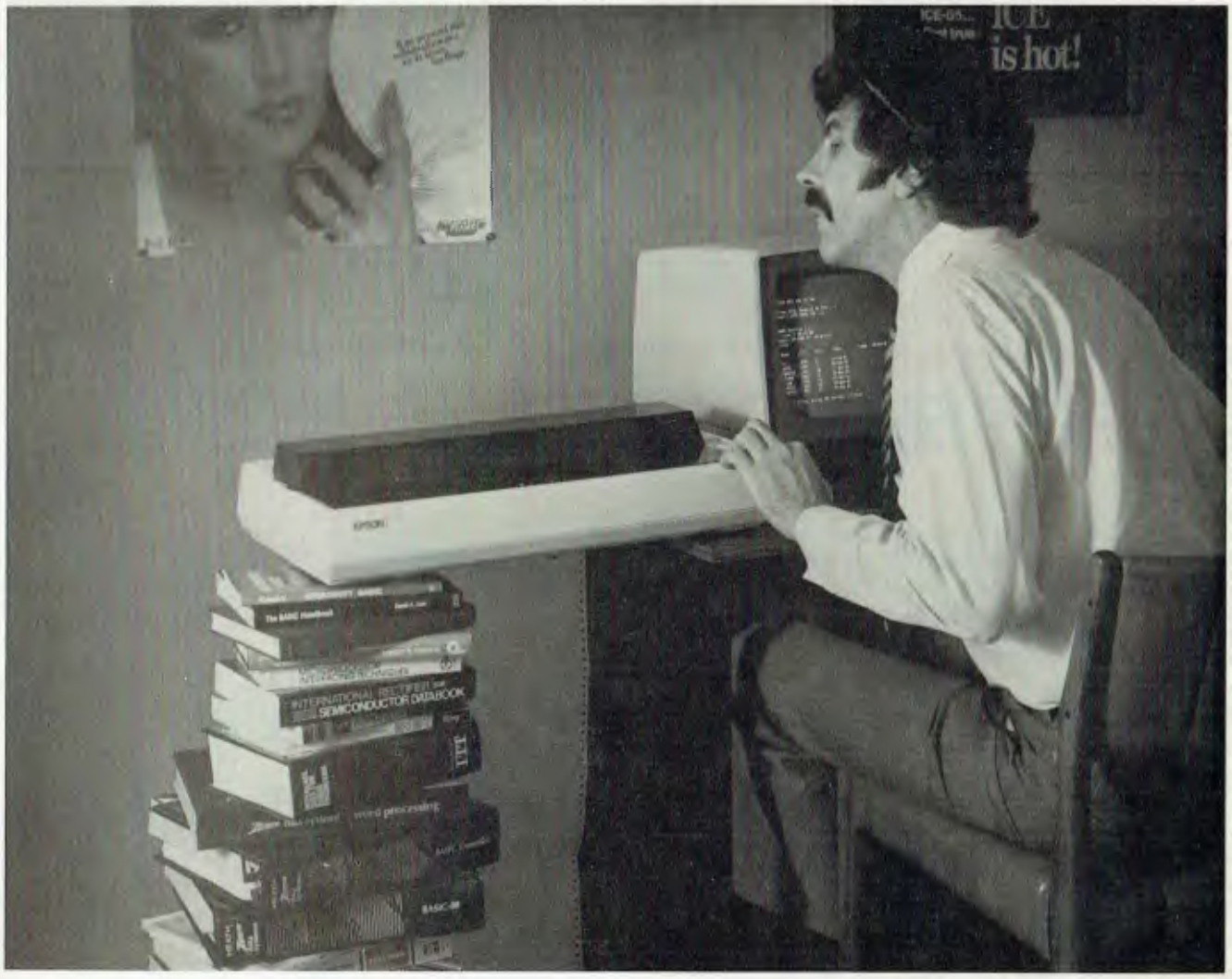

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All in all, the Epson MX-100 is the most remarkable printer we've ever seen in Australia to date. How can you not afford to consider the new MX-100, even if you have to buy a bigger desk!

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WF820/81

your computer clinic

Sinclair Stumper

ON A recent visit overseas I purchased a Sinclair ZX-81 microcomputer which I hoped to use on returning to Australia.

However, when I plugged it in to the aerial socket on my television set I found that the screen was nothing but a great mass of grey distorted patterns.

I believe the problem lies in the fact that the English television sets operate on UHF with 625 lines at 50 frames per second, unlike Australian sets operating on VHF and a different system. Can you suggest a solution to my problem allowing for the fact that my knowledge of electronics is very limited?

M HAUGHTON
North Caulfield, Vic

The TV modulator used in the Sinclair ZX-81 is quite a common type manufactured in either Hong Kong or Korea, if my memory serves me correctly.

Similar units which operate on Australian TV channels are available from Dick Smith and other electronics stores. You should be able to unsolder the existing modulator and replace it with a new one quite easily, and this should solve the problem.

You Bet Your Sweet Apple

AS A keen Apple II user and 'horseplayer' I was most interested in your article in the January edition related to a betting system developed by Mr Clem Hincksman in Canberra.

I have developed my own computer program for assessing 'market price' and 'odds' on roles and would like to get in touch with Mr Hincksman regarding this program.

Could you help by giving me the address at which I could write or telephone him?

T RIMMER
Balgowlah, NSW

Mr Hincksman can be contacted through TCG (Technical Computing and Graphics Pty Ltd) 31-33 Hume St, Crows Nest, NSW 2065. Phone (02) 439-6477.

Applesoft Compiler

I WAS hoping to write programs in BASIC on our Apple][and use a compiler to change the program into machine language.

If we are able to do this, would the program occupy less RAM? Is there a satisfactory compiler on the market?

J V KANE
Mackay, QLD

Yes and no — a compiled program is longer than the same program in BASIC, but of course is smaller than the combination of the BASIC interpreter plus the program.

Since your BASIC is probably Applesoft in ROM, the result is that the compiled program would chew up more RAM than the interpreted version. Of course, it would be much faster.

There is a suitable compiler now available for the Apple. It is called TASC (The Applesoft Compiler) and is produced by Microsoft, which has a good reputation for its previous products. This would probably be the best choice for general usage.

your computer services

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All Contributions: should include your name, address, and home and office phone numbers (in case we need to check details).

Contributions on disk: Contributions can be accepted on 20 cm standard CP/M disks or on 13 cm Apple DOS or Apple CP/M disks. Please pack them extremely carefully if posting, and label all disks with your name, address and phone number.

Style: All items should be typed (or printed) and double-spaced on white paper. Include your name, address, telephone number and the date on the first page of your manuscript (all manuscript pages should have your surname and page number in the top right-hand corner). Be clear and concise, and keep jargon and adjectives to a minimum.

Listings: Unless it is absolutely impossible, we want listings produced on the computer. This reduces the risk of error — if the computer typed it, the computer probably accepted it. Print listings with a dark ribbon on white paper. If they can't be produced on a printer, borrow a typewriter — hand-written material is likely to sit around the office for a year before someone can find time to type it all out for you! Please provide an account of what the program does, how it works and so on. Any comments on the program should refer to the address, line number or label rather than to a page number. Any comments on modifying the program to work on other machines will be appreciated. Try to include a printout of at least part of a sample run if possible.

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